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EDITORIAL.

BRIEUX'S MESSAGE IN DRAMATIC FORM.

According to a chronicler of the life of Saint-Simon, when this philosopher was still in his salad days, his valet was instructed to wake him every morning with the following words: "Levez-vous, M. le Comte, vous avez de grandes choses à faire aujourd'hui" (Arise, Count, you have important matters to attend to to-day); and, though we are not in the position to say that when Brioux was as young as Saint-Simon, his valet—if he had one, which we doubt, being a literary man—received like instructions, the thought which must occur to all thinking readers of his dramas* is that his active brain must have been cognizant for some time before he wrote, that certain important matters—suppressed chapters in our sociology—had either been overlooked by his fellow-writers or had been tabooed on account of the fear of ostracism that Puritanism plus hypocrisy always breeds. We are strong in this belief since no mind that had not studied society in all its aspects and in a way that was individual, and had not given the deepest thought to certain conditions which are generally supposed to be unspeakable, save behind closed doors and then only in whispers, could have struck a new vein so that the drama of to-day would no longer be the inept thing it is in the hands of the majority of writers, but a force out of which untold good could come. And in putting his theses in dramatic form, Brioux shows the acumen of the born reformer; for the drama is far better than dryasdust tracts or even the novel which holds one's attention for a time, since the *tout ensemble* of the stage conveys to the auditor of normal intelligence, impressions that he somehow never gets either from a superficial or deep

*Three Plays by Brioux. With Preface by Bernard Shaw. English Versions by Mrs. Bernard Shaw, St. John Hankin and John Pollock. New York: Brentano's. 1911.

perusal of prose in the privacy of his room. Of course, judging the dramas of Brieux by the canons of dramatic criticism which have been with us altogether too long, they are not in the first rank; but are we sure that our attitude in the matter has been correct, that what we thought right a decade ago should govern what is written to-day? Ibsen upset some of our cherished ideas with a ruthlessness that gave us a shock from which as yet we have hardly recovered; but what the Norwegian did was but a small, insignificant thunderbolt, for his truths never broke company with an idealism that was put forth as a sort of salve, whereas Brieux works in so clear an atmosphere and one so near the earth, that if idealism were temerarious enough to enter the lists it would soon be routed by the facts he presents. But in the columns of this JOURNAL, the controversy which rages in the realms of dramatic criticism, as to whether a drama should be a mere thesis or a literary offering that is not too entirely divorced from the mixture of romance, idealism and the pinch of realism that the modern public demands, is decidedly out of place; but what is in place is the recognition of the works of a master-mind who has written the most sensible words on just those subjects to which a large number of our medical writers at the present time are putting their talents, with what small success need not be commented upon here.

Now what is the great quality of these plays by Brieux? Whether we read "Maternity," "The Three Daughters of M. Dupont," or "Damaged Goods," the one thought which pervades all of them is this: Truth must be stated at all costs, no matter what becomes of good taste: that conventional bugbear of too many writers in the realms of good literature. For truth is all important, and if it is to be driven home there must be no whitewashing by means of good taste, since the process is a weakening one and the ends achieved spell failure.

This is a harsh way of putting things, but it is no harsher than what is contained in the medical article that is informed with the desire to instruct by the statement of bald facts ungarnished by opinions. And though we might say at first sight, that this sort of writing carries the greatest weight in medical literature but is not proper in belles-lettres, our second thoughts would soon teach us how mistaken we are, since the pursuit of truth cannot be effected in any other way. And truth it is that Brieux stands for in his plays, the truth that shall make clear to all, who know how to read, the real cankers that are causing the frets and worries, the physical and mental disasters in our present-day society.

On closing the book before us, the impression that remains is that the essential quality of this unusual writer is a "fine scorn of pleasing." Imagine a play that has all the terseness of a dovetailed conversation that limits itself to the subject in hand, and this with a directness that

refuses to tolerate the slightest deflection into idle talk, and you have the Brieux method. No matter whether the theme is syphilis as in "Damaged Goods," or the control of the number of children in a family as in "Maternity," or the deprivation of the right of motherhood as in "The Three Daughters of M. Dupont," the analysis of the sordid tragedy is brought about, not by the crude instrument that wobbles in an unskilled hand, but by tempered steel whose exquisiteness can be depended on to make such clean incisions that the social sore is soon exposed. Now this is just where Brieux towers above the medical writers who have attempted the same sort of thing, for though they know their subject as well as he, they fail to convince for the reason that they encumber their one thought, which alas! is never overstrong, with so much extraneous matter, in the way of unpractical opinions, that the reader's mind is quickly reduced to a blur that cannot possibly register a tenth part of their ideas.

The "unco guid" in the medical profession, and outside it, will no doubt show resentment to the writings of this very candid Frenchman; but even though this happen, the small number who are interested in the prophylaxis of social diseases and in other questions that are to-day inseparable from the practice of medicine, and who have had sense enough to keep this interest intact by refraining from indulging in maunderings in all sorts and conditions of medical journals, will undoubtedly proclaim him master. And well they might, for this free-lance is not one of those *litterati* who has merely dabbled in medicine so that sensationalism may be evoked, but a clear-eyed looker-on who relates things as they really are with a trenchancy and a sureness of touch that goes a long way in winning our admiration.

AN ACCOMPLISHED AUTOBIOGRAPHER.

The charm of a book is not easy to define, but when it once seizes upon the reader, a kindly attitude is his toward any defects which may occur. And it is well that this should be so, for if it were otherwise the good qualities would be belittled and the weak spots exaggerated. So it is right and proper that the charm of a literary production should get its meed of praise, and be so strong an asset that in the weighing of a book's worth a forefront position should be assigned it. Of course, in some books—those, especially, of a scientific nature—this prime quality may be lacking without any detriment to the value of the production, but this is not the case in the lighter forms of literature, particularly in autobiographies. Who has not read the lengthy self-portraits of all sorts of men and has not wished for some means of castigating the authors for an inveiglement that meant hours of boredom? And this state of de-

pression was not because the writer had not met interesting people, nor because his own life was not punctuated with some stirring events, but because "ill-educated conceit," to use a Ruskinian phrase, destroyed his sense of proportion and thrust him continuously in the lime-light of his own creation. Fortunately there are writers who are not guilty of this offense, and though their number is not startlingly large, it is not so small that one need despair of the sort of good taste that makes for charm in autobiographies. And to this small class belongs Dr. Robert Farquharson, whose recently published autobiography* it would be difficult to outclass on the ground of what should be the pervading spirit of a book if the reader's attention is to be held until the last page.

A canny Scotchman, indeed, is Dr. Farquharson and a close observer of the human procession. His humor is never absent, but it is never of the disagreeable sort that easily deteriorates into mordacity and a growl. The kindliness of his brand is most engaging, and what with the shrewdness which is characteristic of the Scotch, the tale he unfolds is just the sort of delightful criticism that bespeaks a point of view of unquestionable originality. And this is evident whether the description centres around his home life during his childhood and schooldays, the celebrities of Edinburgh, the professors of Edinburgh University, or his life in London and the Continental capitals. But what is best, when this happy combination is present, is that the reader quickly arrives at the true measurement of the writer; for no romantic view of oneself can endure in the face of a judgment that is ever on the alert for human foibles. And here it would be well to remark that Dr. Farquharson's personality is never kept in the background despite his inherent modesty, but plays over all the pages as would a lambent light that illuminates without too much glare and sputter.

To select the best parts of this autobiography and reproduce them here would occupy too much space and, moreover, might be a disappointment to the reader; for only too often are excerpts completely emasculated by wrenching them from their environment. But though we hesitate to do this, the chapters devoted to criticisms of the medical men in the 'sixties of the nineteenth century are so liberally strewn with clever comments that to refrain altogether from quoting would be an injustice both to the author and the reader. What could be more to the point than when Dr. Farquharson writes: "Simpson's fame will, of course, rest largely on his discovery of chloroform, but I have always felt that he got more than his due share of credit. For Sir Humphry Davy found out laughing gas, although he did not fully develop its anaesthetic properties. Then Jack-

*In and Out of Parliament. Reminiscences of a Varied Life. By Right Hon. Robert Farquharson, P. C., M. D., LL. D. London: Williams and Norgate. 1911.

son, the American dentist, drew teeth under ether; and chloroform was first made by Soubeiran of Paris, and Simpson was advised to try it by Waldie, a chemist of Liverpool"; or these two anecdotes about French medical celebrities: "Becquerel, whose oft-repeated prescriptions of *venteuses sèches et venteuses scarifiées* used to amuse me; and Bouillou, a great heart specialist, who practised the Sangrado treatment of bleeding *coup sur coup* with or without the copious draughts of hot water. For in these days a disease was considered to be a sort of entity to be wrestled with and violently expelled, and the modern notion that we really cannot cure anything, but merely watch the processes of unnatural Nature, so to speak, and maintain the bodily forces and watch for complications, had not yet been adopted, and a doctor who did not do something drastic in face of an emergency might just as likely as not be censured by the coroner if an inquest became necessary" and "Maisonneuve, a thorough butcher in looks and ways, went one better [than Malgaigne] by his truly diabolic method of removing limbs by *diaculisie* or 'rupture.' He first broke the bone with a loud report by means of a complicated arrangement of blocks and screws, and then cut through the soft parts with a sort of wire loop gradually tightened until the limb dropped off. It is hardly necessary to ask what was the outcome of this barbarous method of so-called surgery, and I suppose that the result of the appearance of the patient in the dead-house would be to label him *mal guéri*."

From the aforementioned anecdotes it might be imagined that Dr. Farquharson's interesting volume deals wholly with his medical career. to the exclusion of that larger life whose fullness means those intellectual diversions without which aridity is its hall-mark. No greater mistake could be made, for not only has he met numbers of interesting personalities in the House of Commons, of which he was member for West Aberdeenshire, but he has lived cheek-by-jowl with such men as Orchardson, the painter, Dr. John Brown, James Payn, Robert Chambers, William Blackwood and others too numerous to mention. Now all these men were not mere specimens of animated clay to be bowed to and talked to for a minute, but entities from which anyone with acumen could derive large benefits. Whether it was his degree of affability or his lack of superior airs, the fact remains that Dr. Farquharson got to close grips with them; and what was their profit is not so much to the point as what was his, for on every page one may detect undeniable signs that here is a physician, thrice fortunate, whose boundaries of daily existence were ever widening on account of an association that falls to the lot of few in the profession.

OPINION AND CRITICISM.

THE BARBER SHOP IN A NEW RÔLE.

The criticisms which have hitherto been visited on barber shops in general have been of the same texture: a broadside of more or less truculent denunciation of the careless methods in vogue and of the gay insouciance of all barbers in the face of diseases which their inattention to the first rules of asepsis is the means of propagating. That our low opinion of the ordinary barber shop, especially as it obtains in this country, has been effective only in lashing us into a fine frenzy of indignation is common knowledge to all; but then it should not be forgotten that medical men, as a general thing, have too high an ideal to fit in with what legislators conceive as the practical side of life. Now though it is a fact that progress, on the lines which would make for the desired improvement in the matter of the proper care of customers when at the mercies of the barber, is not the heartening chapter some would have us believe, on account of what they have observed in the way of an improved cleanliness, all hope should not be abandoned; for though the recent occurrence in which Sir David Bruce, of the Royal Army Medical Corps, slapped the face of a barber's assistant, one Robert Meredith Roberts, for inflicting a cut on his face while concentrating his attention upon another customer, was not incited by a grievance against the insanitary condition of the shop, it has this to its credit that at last the docility of a customer has been proved to be more perishable than adamant; a view which is not entertained by the majority of barbers.

Despite the fact that the foregoing incident occurred in a place as far removed from this country as is Abergele, Wales, the lesson brought home to us is one that should be conned with considerable care; for the hero of the occasion was a medical man who undoubtedly knew the possible consequence of a cut received at the hands of a not too clean barber, and that a reprimand would fall only on inattentive ears. A medical man, generally speaking, is not the sort of hero who deems it absolutely necessary to get satisfaction immediately a wrong is offered him, and whether it be his science or his knowledge of the foibles of humankind that teaches him toleration, the fact remains that under the most adverse circumstances he is often an illuminating chapter in geniality. True, he is not oblivious to abuses; for almost directly he reaches his study the ink flows from his pen in verbiage that is technical enough to delight his brethren, but so masterfully involved that should the article be reprinted in the lay press, no layman would be the better for having

read it. But in the case of Sir David Bruce the reprimand in the shape of a good, honest slap can be understood of all men.

While belligerency on the part of the medical profession should not be too greatly countenanced—what have not been the blows exchanged between some of its most honored members!—its general adoption, in cases similar to the Abergele occurrence, might be more effectual in bringing about the reforms which the medical press in this and other countries has been clamoring for during the last decade or two than all its printed words; for, while the latter make the circumlocutory reading that befogs the ordinary intelligence, the former is so devoid of extraneous matter that he must be a stupid barber, indeed, who will not know exactly the sentiments of his outraged customer. And in this age which is so proud of its “short roads to knowledge,” why should the barber be excluded from benefits which would give him the readiest comprehension of what is expected, in the way of asepsis, by a customer; a bit of knowledge that even the popular article on tinea sycosis and other “tonsorial” diseases cannot possibly convey to him.

THE CONTROL OF TYPHOID FEVER.

Now that the season in which typhoid fever runs rampant is on hand, it were perhaps well to emphasize some points brought out by recent work on its control. It is generally admitted that this is a preventable disease and that its presence in a community is evidence of carelessness, ignorance, or a practical inability to control a situation. Every case of typhoid arises from another, and it is a trite statement to say that the ultimate source of all epidemics must be the improper handling of the individual case. Therefore, while a broad duty of protecting the water-supply from contamination rests upon the state, there is a well-defined duty which each physician should perform if the typhoid situation is to be controlled. This duty can be easily and conveniently divided into the task of recognition of the disease and of protection of others from any source of contamination by the patient.

The recognition of typhoid is by no means always an easy task, especially in the early stages when the excreta are as dangerous as in the late florid stage of the disease. The clinical picture is far from being well defined and an attack of influenza may simulate typhoid. The clinical picture is, however, strongly suspicious, and in view of the extreme importance of an early diagnosis, during the typhoid months every suspicious case should be considered a menace to the public health. Unfortunately also the laboratory aids in the diagnosis are likely to be found only in the later stages. Blood-culture, which will make the diagnosis in a large proportion of cases during the first week, is not a convenient or very practicable procedure for general use, although it would seem that no better service

could be rendered by Boards of Health than by the performance of blood-cultures for the practitioner as freely and as liberally as they now make throat-cultures. The demonstration of the typhoid bacillus in the feces is a task beyond the scope of any but the best specially equipped laboratories. The practical obstacles in the way of a general employment of these two means of diagnosis have left us the Widal test as the only specific diagnostic weapon in our equipment, and the limitations of usefulness of this test are manifold. In the first place, it rarely is present before about the tenth day, and in many cases it may not be positive, even though the clinical course of the disease leaves no doubt that the case is one of enteric fever. The Widal reaction nevertheless occupies the most important position to-day in the control of the situation; for not only is it positive in most cases at some stage, but it is also present in those mild cases of the disease which do not resemble real typhoid, and which, but for a positive agglutination test, would be cast aside as unworthy of the attention of public health officials. These mild cases are just as dangerous as are the severe ones, and require just as much attention to prevent the spread of the disease.

The practitioner's duty in the prevention of the spread of typhoid is a simple one, and consists in the care of the excreta of all cases, definite and suspicious, and of safeguarding those associated with the patient from direct contagion. It is not our purpose to detail means of disinfecting excreta, screening patients from flies, or prevention of pollution of the water supply. These things are common knowledge. We wish to emphasize the extreme importance of consistent employment of this knowledge in the battle to conquer a plague whose presence is a slur on medical ability.

THE CULTIVATION OF SPIROCHÆTA PALLIDA.

During the last decade probably more advances have been made in our knowledge of the etiology, pathology and treatment of syphilis than in any other field of medical research. Schaudinn and Hoffmann's discovery of the presence in syphilitic lesions of a pale thin spirochæta was soon followed by improvement in the technique of finding them, so that it became an easy matter to make an early diagnosis of syphilis. The constant presence of this spirochæta in syphilis, its absence in other than syphilitic lesions, and its presence in the lesions of syphilis transmitted to apes and rabbits by inoculation of syphilitic material from the human, made it fairly probable that it was the actual cause of the disease. Yet all the postulates of Koch had not been fulfilled, and necessarily scientific opinion reserved its verdict until full proof was given. Attempts to grow the organism in pure culture and to reproduce the disease with such a culture had not been successful until very recently, when Noguchi

reported from the Rockefeller Institute a comparatively simple means of cultivation.

By means of stab-cultures in serum-water medium containing a piece of rabbit tissue and grown under strict anaërobic conditions, Noguchi was able by repeated transfers to grow the spirochæta in pure culture. This culture when injected in the testes of rabbits produced the typical lesion of syphilis, from which the spirochæta could again be grown. Thus all of Koch's requisites are now filled, and the medical world must accept the spirochæta pallida as the undoubted cause of syphilis.

It would be well to note here that on account of the development of our knowledge of syphilis, there can be no further doubt how dependent are scientific advancements on the mastery of technical difficulties. The spirochæta has always been the cause of syphilis, yet it was only good technique which permitted its discovery. The Wassermann reaction is a masterly adaptation of scientific principles to practical purposes, and its execution requires the most skillful technical knowledge. Salvarsan was the result of years of application in the chemical laboratory in pursuit of an ideal; and again, Noguchi's latest addition is another indication that only by mastery of technical difficulties can science ever expect to make epochal advances.

LITERARY NOTES.

A book, which surely should be in the hands of all physicians who "waste" a few hours each day reading something besides medicine, is "The Corner of Harley Street" by one "Peter Harding, M. D." (Houghton Mifflin Company, Boston and New York). In the thirty letters contained in the book are enough literary grace and kindly philosophy, enough of that knowledge of things which is not pedantry but something much better, to assuage the outraged feelings of all those medical readers who have suffered, for many a day, from the onslaught of the solvers of problems; those beings of little wit but much conceit who are continually dinning their theories into our ears in the hope of making converts. What has not been written on the subject of sexual instruction, yet how few of the chapters can compare to Peter Harding's letter to the Rev. Bruce Harding, S. Peter's College! In this communication he sets forth his ideas with precision and clarity, but though his ideas are better than most which we see in connection with this vital matter, it is not their soundness that makes the strongest appeal, but the manner of their presentation, for here are gentleness and culture, and that broad outlook of life which precludes the blatant jeremiads of the majority of writers. Whether Peter Harding is writing to his aunt as to whether a ring worn on the third finger, as suggested by her, is really the best treatment for rheumatism, or giving advice to his son on the important subject of

a medical career, or characterizing Mrs. Humphry Ward's reputation as a novelist as "the twentieth-century triumph of the college-bred lady inspector," he illustrates the geniality which only can come when a spacious mind is not so enraptured with men and books but that there is room for a gentle consideration of the foibles of the former and the defects of the latter.

Aside from the personal note, which is one of deep religious feeling, the little book which Dr. Robert N. Willson has written on the subject of "Medical Men in the Time of Christ" (The Sunday School Times Company, Philadelphia) is not without value, if value is to be judged by compactness, brevity of statement, and only occasional comment that is above the ordinary. In short, here is a book that will tell the busy practitioner—busy because he does not as yet know how to live on twenty-four hours a day, according to Arnold Bennett's prescription, and hence cannot devote much time to the reading of elaborate works—a number of interesting things about medicine in the past, and especially about some of the problems which he thinks ultra-modern, because of a lack of knowledge of what was attempted and partly accomplished in remote ages. By the side of such a monumental work as Neuburger's "History of Medicine," Dr. Willson's little book is of mean performance; but how many of us have read Neuburger's elaborate work, though when put to the test we may claim some knowledge of its title?

According to *Paris Médical* of June 10th, the Adam and Eve mansion at Mans, which was latterly in danger—so rumor runs—of being bought by an irrepressible American millionaire and then taken piecemeal to the United States where it was to be reconstructed, has happily been saved to the town by the intercession of its municipality. This celebrated mansion was built between 1520 and 1525 for Jehan de l'Espine, astrologer and doctor of medicine, and got its name from one of its bas-reliefs which represents Eve offering the apple to Adam. In 1556 the house was sold to Denys Gouffon; later it passed into the possession of Pierre Gougeon, councilor of the king and seneschal of Mans. In 1603 François Duchesne, doctor of medicine, was its owner; and in 1604 the records show it was bought by Antoine Lemoine, a bailiff. It was owned by François Lemarchand, a baker, in 1734, and then by Thomas Davoine, a carpenter, whom we take it was the owner upon whom the ubiquitous millionaire attempted to exercise the fascinations of the American dollar. Despite the vicissitudes through which it has passed, the Adam and Eve mansion is still highly prized by the burghers of Mans, and well it might be, for its architectural features are unique and its history not without interest.

ORIGINAL ARTICLES.

THE TREATMENT OF BACILLARY DYSENTERY.

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Dysentery is a term used to designate a morbid condition, characterized by inflammation of the colon and, occasionally, of the lower end of the small intestine as well; hence, it is a colitis or enterocolitis.

It is an acute infectious process which, on etiological grounds, can be divided into two diseases: (1) Amebic dysentery, due to the invasion of the mucous membrane and neighboring tissues by a protozoön, the ameba coli, and (2) bacillary dysentery, due to the pathogenic action on the same structures of a bacillus, or of members of a group of bacilli, spoken of as the *Bacillus dysenteriae*.

The pathological changes of either type have certain distinguishing marks of their own; the symptoms vary somewhat and the sequelæ are not identical; and yet the two are so nearly alike that without the finer aids to diagnosis, the use of the microscope and culture, they may readily be confused.

The bacillary form is the one peculiar to this climate and to the United States, though amebic dysentery is every year more frequently met with even in this city and among those who have not been in the tropics; first, because the stools of dysentery are constantly more carefully examined and, secondly, because, since the acquisition of tropical possessions, more patients are invalided home to disseminate the disease.

This article deals with the more common or bacillary form.

The short incubation of two or three days, the rather sudden onset, with fever, diarrhea, colicky pain and tenesmus, the appearance shortly of mucus in the stools, streaked with blood, later looking like chopped or shredded beef that has been washed out in water, are merely mentioned here to recall what the condition and symptoms are which we have to consider in the treatment.

Therapy.—There are few self-limited infectious diseases that are accompanied by such continuous, nagging discomfort and distress as dysentery. Our ingenuity is exercised to the utmost, not merely in the efforts to shorten the process, but even in attempts to afford some comfort. For success much depends on ability to secure rest.

Rest.—One might assume that the train of events in dysentery would compel rest, and so, indeed, in severe cases it does, but in the cases that in their incipency promise to run a mild course it is often difficult to get the patient to bed; and his failure to accede to such advice may determine a very severe process in what might otherwise have been relatively benign.

Rest in every case is desired both for the body at large, suffering from the effects of the toxins of disease and of pyrexia, to shelter metabolism by avoiding unnecessary work and so diminishing the demand for food to meet such metabolic needs and sparing the organs concerned in digestion, assimilation and utilization of these foods, but also for the particular organs or tissues that chance to be the sites of lesions caused by the disease; in this case, the large intestine. Now, the large intestine is a receptacle for certain materials, in part passed on from above, in part excreted from its walls. In this material fermentative and putrefactive processes are going on as the result of bacterial action. From this material, water and certain substances in solution are being absorbed. This structure, the bowel, is in a condition of active muscular exercise, the site of peristalsis, of a swinging pendulum movement, and finally is pressed upon and massaged by contiguous structures as the result of the action of the muscles surrounding the abdominal cavity, from which arises so great benefit from walking and gymnastics directed to the abdominal muscles in constipation. It will be our effort to diminish the activities of the large intestine, that is, to secure rest. By putting the patient to bed we avoid the squeezing and massaging due to muscular action and so take away one stimulus to increased peristalsis; an important factor, considering the hyperactivity of this function, upon which the frequency of the movements and the colicky pain so largely depends.

Even the bed is a bed of unrest, for the griping pain is always forcing the patient to seek some position to relieve it.

Bed.—Far more work is to be done about this bed by nurse or attendant than about the bed even of a typhoid fever case. The constant use of the bed-pan, the soiling that necessitates changing of the bed-linen, the soothing applications to be made, the irrigations to be given, all demand as much economy of effort as can be procured by favoring conditions to work under. The bed, then, should be chosen with care. It must be a narrow or half bed, best of the hospital type, which is about 6 feet 6 inches long, 36 inches wide and 24 to 26 inches high. The spring of woven wire must be stiff and the mattress of hair preferably firm. Over this is placed the sheet, long enough to tuck well under and draw smooth and taut. If the surface of the mattress is not smooth a folded blanket under the sheet will make it so.

Over the sheet is put a rubber-sheeting that should extend from the pillow to the bend of the patient's knees and wide enough to tuck under. Over this comes the important draw-sheet, a long sheet folded length-

wise and laid across the bed covering the rubber-sheeting and tucked far under one side. This sheet can be drawn toward the other side, little by little, to afford a cool fresh surface under the patient from time to time, or, if soiled, can be replaced without remaking the whole bed. Over the patient is placed the upper sheet and one or two blankets arranged with a view to comfort.

It is very well to have a second bed of the same kind, to which a patient can be drawn while the mattress and clothes of the first are airing.

Room.—Every sick-room, should be large, well ventilated, and should get sunshine. As, however, the disease is far more common in the summer than at any other time of the year, it is well to select a room in which there shall be shade the most of the day. Morning sun and afternoon shade are, of course, ideal. If there is a balcony on which the patient can be wheeled it will, if it is properly screened, serve as the best room possible in the warm season.

A bath-room contiguous to the sick-room is extremely desirable, saving much labor of fetching and carrying, as is obvious.

The odors, which in some cases are very offensive to the patient as well as to attendants, may be mitigated by good ventilation, by one of the many deodorants on the market, whose claim to disinfect the community when a few drops are shaken here and there must not be taken seriously, by the burning of joss-sticks, etc.

Care of the Body.—A cleansing bath should be given each day, if there is a skilled hand to administer it or the manipulation does not cause too much exhaustion.

It is given between blankets, the patient divested of his night-shirt being rolled on one and covered by another. Soap and warm water at 110° F. is used, one part of the body after the other being exposed and attended to and then dried.

The feet may be placed in a small foot-tub in the bed, the knees being drawn up. After the bath the skin may be rubbed with alcohol and dusted with drying powder—one of the numerous talcum or toilet powders in use.

An approximation to this detail can be attained by an attendant in the family, if care is exercised.

The mouth should be attended to by rinsing after every feeding and, if in bad shape, carefully cleansed by gauze or absorbent cotton around the finger of the nurse or on some applicator after dipping into some cleansing solution, like a Dobell's solution or $\frac{1}{2}$ strength Listerine. If very bad, peroxide diluted one-half with water or salt solution may be used before the mouth-wash.

When the mouth is very dry, equal parts of albolene and 2 per cent. boric acid solution with a little lemon juice gives relief. Glycerine is sometimes used, but if the mouth is very dry, it may be aggravated by the glycerine which takes up water so readily.

Constancy of attention and patience are needed to nurse these cases properly, because the restless patient is disarranging the clothes and seeking a comfortable position every moment. The knees are often drawn up to lessen the tension of the abdominal muscles, a hard position to maintain as the feet slip on the smooth sheet. A folded blanket or pillow under the knees gives comfort.

Rings and air-cushions may be needed to take the pressure off the bony parts daily becoming more accentuated.

Nothing is more striking and real than the intangible something we call the "atmosphere" of the room, and it is the ability of the trained hand to secure order, neatness, quiet and calm that gives courage both to the patient and doctor.

Frequent visitors, garrulous friends, Job's comforters, pedlars of similar experiences, *id genus omne*, are to be excluded as a part of the treatment.

The bed-pan in this disease is the most important article in our armamentarium, and its skilful use is imperative. The distressing condition that obtains in some of these cases is hard to appreciate unless witnessed. I have seen stools coming every fifteen minutes with tenesmus that deprived the patient of all sense of relief after the stool, and keeping up for hours, until the patient begged that the pan be not removed at all.

The pan should be warmed before using, the patient's knees flexed and a hand placed under the lower part of the back to raise him. The same thing is done on taking the pan away. Either a clean pan can then be slipped under the patient or a towel may be placed under the pan to begin with, upon one or the other of which the patient lies while the parts are carefully cleansed, dried, rubbed with alcohol and dusted.

It is very essential in this disease that the patient's body and abdomen should be kept warm, as chilling aggravates the diarrhea. Woolen material should be worn over the abdomen. If the feet are cold the hot water-bottle is to be used.

Diet.—During the first few days of the attack, when the stomach is often very sensitive to food, and nausea and vomiting are a feature, and while the evidences of intoxication are most marked and peristalsis most active, the quantity of food is of less importance than the quality.

The food must be bland, non-irritating and non-stimulating to the gastro-intestinal tract, must be readily assimilable and leave but little residue, and must be concentrated, especially with reference to its proteid content. All these conditions are met by milk better than by any other food.

It has been my lot to have a great many cases of dysentery to treat. Most of them, to be sure, were of the moderate type, but not all.

It has been my routine to put the patient on a milk diet, ordering the milk boiled and given every two hours, the patient is to take what he will of 8 ounces.

Why boiled milk should be any better, if as good, as clean raw milk in this condition, I cannot offer adequate explanation. I can only plead handing a leaf out of the book of my own experience. If the patient prefers it raw, or boiled milk distresses him, I do not persist in my prejudices. At the beginning of the attack, especially if there is much fever, I dilute it $\frac{1}{4}$ or $\frac{1}{3}$ with plain boiled water, or barley water or rice water. Preferably plain water. If there is a coated tongue or flatulence or the milk does not seem well borne, I suspect that the fat is not well borne and have the milk skimmed.

I believe the experience of our pediatric practice with reference to intolerance for fats can afford us practical information in its usage in adults.

When the temperature disappears and the stools have lost their diarrheal character, one may allow barley jelly, and thoroughly boiled rice; later, toast, then an egg, then a chop and then gradually the resumption of a normal diet.

When, however, a case runs a chronic course, the same needs for sufficient foods to make good the body losses prevail as in typhoid fever. These will be taken up shortly.

All food should be given warm, for if cold or very hot, peristalsis is aggravated.

Water should be given freely, as it must be appreciated that there is a constant and great loss of water to the tissues. It should not be given too cold or in too large amounts at once, for reasons just expressed.

If, however, milk cannot be taken, one may use barley-water, rice-water, egg-albumin, thin chicken broth.

Milk sugar may be added to the foods given so as to increase the caloric value.

If there is much gastric disturbance, all foods must be stopped, until it is removed.

Care of the Bowels.—As the treatment of the disease resolves itself pretty much into the treatment of the bowel, the preliminary catharsis only will be touched upon here and the rest taken up under symptomatic treatment.

The object of the preliminary catharsis is to clean out the intestinal canal as far as possible before beginning treatment. That the patient has diarrhea and frequent diarrhea is by no means proof that the intestine is clear. It is undoubtedly Nature's intent that it should be, and the diarrhea is but an expression of the intestine's effort to rid itself of irritation, which effort may be futile or abortive, without help.

There are three cathartics especially recommended for this purpose. Calomel, salines, and castor oil.

Personally, I am emphatically in favor of castor oil. I prefer it because I believe it as effectual as the others in evacuating the bowel; because I believe it less irritating than the others and because I am convinced that it has an after-constipating effect.

A recent paper read at the American Pediatric Association by Abt of Chicago dealt with the study of the effects of repeated doses of these three cathartics in infants in doses usually used in diarrhea, with reference to irritating effects produced, as expressed by the presence of mucus and occult blood. After the second dose—the doses given at two hour-intervals—calomel was followed by increasing amounts both of blood and mucus; salines by less and castor oil by least and but little unless in large and long continued doses.

I would not convey the impression that this occurs in the adult enough to decry their use, for I think that would be unfair.

If there is nausea and vomiting accompanying the attack, one gives calomel in divided doses, gr. $\frac{1}{4}$ or gr. $\frac{1}{10}$ every ten or fifteen minutes until one or $1\frac{1}{4}$ gr. are given, for the anti-emetic effect of the drug as well as its cathartic; then, if the stomach is quiet, give the oil, or failing that, salts.

Now, castor oil never was looked upon as a delicacy and the very sight or mention of it is so keenly associated in the minds of many with the ordeals of childhood that it is flatly refused or taken under bitter protest. Because of this fact, so-called tasteless preparations are offered or its taste is covered or it is given in capsules.

There are several ways of giving castor oil while at the same time disguising its taste, and this may be so successfully done at times, as to make it desirable to administer it without announcing its character. Many vehicles, however, like hot black coffee, sarsaparilla, soda or beer are unsuited to the conditions at hand, while to give it in milk is to violate a rule that cannot be too emphatically insisted upon—"never give disagreeable medicines in a food."

The disguise is not complete and the association may turn the patient against an important food.

An excellent method is to put a teaspoonful of brandy, whisky, wine, lemon, orange-juice or peppermint water in a wine or egg glass, let it run all around the surface to wet it, pour on to that 5 teaspoonfuls of castor oil from a spoon previously wetted in hot water to let it run easily, over the oil another teaspoonful of the same substance, and instruct the patient to take it quickly, wiping the lips and allowing him to suck an orange or lemon.

The dose is, then, $\frac{1}{2}$ to 1 ounce.

Specific Treatment.—A specific serum was elaborated by Shiga, which in his hands gave very flattering results that have failed of confirmation. Flexner also prepared a serum which was used in a considerable series of cases of infantile dysentery, but with results that gave little encouragement.

Empirical Treatment.—One drug in dysentery has given me more satisfaction than any other, one drug outside the so-called specifics, and that is castor oil.

The following prescription advised by Dr. Francis Delafield of this city has been especially satisfactory:—

R Olei ricini.	10.
Salol.	2.50
Tr. opii deodorati.	1.
M. et Div. in capsulæ no. xv.	
S. One every two hours.	

The results are truly most gratifying and I have had to have recourse to no other prescription in a large series of cases of dysentery, but, that does not include the severest types described, or the tropical variety (amebic).

One capsule is given every two hours and when the stools begin to diminish materially, one every three hours and with still further improvement every four hours.

I believe the improvement is due to the small doses of oil, for the results are very satisfactory without the opium; and one may give the prescription without the opium in the milder cases and when the stools begin materially to decrease in number. The small dose of opium, equal to 1/10 gr., does, however, add its own effect and relieves the pain.

I am not convinced of any particular value on the part of salol. Perhaps it adds its own anodyne and antipyretic effect; any antiseptic virtue, I doubt.

There is one very important adjuvant to this treatment, also insisted upon by its advocate—namely, the administration every second day or at least every third day, of further large doses of castor oil as in the beginning.

The small doses are unquestionably constipating and the diminution of the stools is the result we see, as well as improvement in their character. We have to remember also that in the meantime fecal matter is collecting, mucus, bacterial toxins and bacteria themselves are gathering, and damage from these sources with a recrudescence of the disturbance will follow unless evacuation is attained at suitable periods.

Somewhat similar to this castor oil treatment is one warmly advocated in some quarters, but about which I can speak less authoritatively—namely, the saline treatment.

Sodium sulphate or magnesium sulphate is given in a half ounce or ounce dose, then followed by one dram doses of the salt every two hours, three hours or four hours as improvement occurs, or dram doses every hour can be given until the initial catharsis is accomplished.

Finally, through many generations by many competent observers, ipecac has been used in the dysentery of the tropics and has been considered almost a specific.

It is very rarely used here, for we have little need for it and when tried the results have not been particularly good. Whether this is due to

faulty technique or half-hearted efforts at such heroic measures, one cannot say.

The doses are colossal, gr. xx. and gr. xxx., to be repeated in four to six hours, and necessitate considerable doses of opium at the same time to prevent the emesis that otherwise would surely follow.

Symptomatic Treatment.—Pain. Between the constantly recurring griping, twisting, colicky pains and the incessant nagging of the tenesmus, exhaustion threatens; so that the symptom is one of the most urgent in its demands for relief.

This may be afforded by topical applications or drug administration.

Heat to the abdomen is one of the best measures we have at our command. It can be applied in the shape of hot fomentations, turpentine stupes or thin poultices.

To give a fomentation take two pieces of thick flannel; an old blanket affords just the material we want, cut into squares to cover the abdomen.

Have ready in addition another piece of flannel for a cover or protector and a towel with sticks sewed across either end to answer as a wringer.

Lay the flannel squares in the towel, pour boiling water over them, saturating them thoroughly and then quickly wring out in the towel by twisting the sticks in opposite directions to each other. The wringing must be complete and no water be left in the flannel. Take this out quickly, shake it once in the air, place it on the abdomen and cover with the protector. Before the fomentations are applied, the skin may well be lubricated with vaseline.

It is helpful to have the patient in a blanket which can be brought up over the fomentations.

These may be applied every ten or fifteen minutes until relief is afforded.

Turpentine stupes are prepared in much the same way, a dram of turpentine having been added to the hot water into which the flannels are to be dipped or the stupes may be sprinkled with a little turpentine after they have been wrung out or a bit of absorbent cotton wet with turpentine may be passed lightly over the abdomen before the stupes are applied. Careless application of the turpentine may result in a burning of the skin.

The frequency of application and the length of time they are to be left on will depend on the reaction of the skin to the turpentine and the efficacy of the measure.

These devices not only lessen the spasm, but by so doing diminish the frequency of the stools.

Comfort may also be afforded by warm rectal irrigations, at 100° F. to 105° F. of plain water or, better, physiological salt solution, one teaspoonful (1 dram) of salt to the pint.

These irrigations are considered by some men as an important item in the treatment of the inflamed colon and are especially in vogue in children's practice. I have had to have recourse to them in adult practice,

in the acute stage but rarely finding the prescription given above together with fomentations sufficient.

While at times the irrigation does good, I prefer to do without it if possible, because it can be overdone and one feels that often when it is done, the bowel gets more excitation than rest by the procedure.

The tenesmus frequently requires drug treatment and we prefer to give it locally at first. This can be done by the suppository containing gr. ss of opium or in more severe cases by the morphine suppository which contains gr. ss or by one combining opium and belladonna, e. g.:

R Opii pulveris.gr. i.
 Ext. belladonnae fol.gr. $\frac{1}{4}$
 Olei theobromatis.q. s. (gr. xxx.)
 M. et Fiant talia suppositoria no. xii.
 S. One inserted as directed.

Another time-honored method of using opium by the rectum is through the medium of starch mucilage.

Give m. xv. in an ounce or two of the starch preparation, injecting slowly. In an irritable bowel the smaller amount is more easily retained.

There are cases in which the pain is too great to be relieved by these efforts, and morphine has to be used hypodermically. When this is done, appreciate that a fight is on and the drug habit is the antagonist. Use it sparingly, both as to dose and periodicity, and take the evidences of pain rather than the assertion of the patient as the criterion of its usage.

Diarrhea.—The stools of dysentery are characteristic. They are small, often not a teaspoonful at a time, and consist of little clots of mucus for the most part blood-stained, like soaked meat. It is evident that these stools no longer represent a conservative process, but are the simple expression of the inflammatory process. They test the limit of the patient's endurance. They have to be controlled or rather the bowel must get the rest that a diminution of the stools bespeaks.

Numerous drugs have been advised. They may be divided into three classes: Astringents, local sedatives, and opium.

I do not like the first. Astringents operate by inducing changes in the protoplasmic substance of the cells, that threaten their integrity. One feels that it is heaping Ossa upon Pelion in the acute process.

I pin my faith on the last two, and especially opium.

As to bismuth, its action is largely protective, though, perhaps, to some slight degree partaking of the astringent properties of all the heavy metals. If it is the purpose to coat over the mucous membrane with bismuth, or even if this theory of its action is not correct, still experience has shown that to do real good it has to be used in large doses. It is insoluble and non-toxic, which statements may stand good as far as they influence its therapeutic use.

It should be given in at least gr. xxx doses every two hours until results are obtained. The easiest way to give it is in powders. A powder

in a little water, a shake which diffuses it in suspension in a second, and take so.

One warning must be offered born of experience.

Be sure that at least every second or third day the bowel is emptied by a dose of castor oil or salts, for these large doses of bismuth collect in the bowel and by sheer weight do harm to the gut. One of my most vivid recollections is seeing a case to which bismuth had been given for weeks without catharsis and with the continuance of the symptoms to a point of dubious prognosis.

A large dose of oil was followed by movements that literally filled the bed-pan with black masses of bismuth that looked like fresh tar-concrete and must have weighed pounds. Recovery started from the time of this relief.

Upon opium we are dependent for our best results.

It diminishes peristalsis and so the cause of pain and tenesmus, it diminishes the stools, it lessens pain and permits rest and sleep; rest for the bowel, rest for the body and rest for the mind.

There are three things that should be emphasized about the use of opium in these cases:—

1. Never use it until the bowel has been efficiently emptied by one of the cathartics advised.
2. Use it in the smallest amounts that will get results. I have rarely had to use it in greater amounts than 1/10 of a grain, that is one drop of the tincture every two hours.
3. Do not advise the patient of the fact that you are using it. The profound effects of opium that will permit him to appreciate that he is getting it will not be manifested in these doses.

Again the necessity of the cathartic at intervals of two or three days should be emphasized.

Duration.—Most cases run a course of a few days to a week or a trifle more, a certain number continue three, four, five or six weeks and then cease or pass over into chronic form.

When a case is passing over into a chronic form, if seen for the first time, the effects of such medication as has been advised may be tried long enough to test its worth; if of no avail, make use of topical measures and give as little medicine as possible, especially avoiding opium on account of the danger of the habit.

In the chronic form the use of the irrigation is more valuable than in the acute.

There is one thing about the irrigation and the use of all topical measures to be insisted upon and that is, if used in the acute stage assiduously the chronicity of the process may be due to the irritation these very measures keep up, and a cessation of all local treatment be followed by rapid improvement. Again, when these methods are pursued in a chronic case, improvement may be seen up to a certain point and then cease or the

condition grow worse. Here again stop the treatment and study the effect.

The irrigation is to be done with the patient in the dorsal position with the hips elevated and on a douche-pan, or lying across the bed on a rubber-sheet so arranged as to form a gutter for the discharge of water.

Sometimes the bowel is better filled by putting the patient on his left side and then turning him to his right, so as to seek the assistance of gravity in following the line of the colon.

If the patient is fairly strong, the more trying knee-chest or elbow position may be used.

The tube should be long and soft, a rectal tube, a stomach siphon or a large rubber catheter will answer.

The tube is warmed, lubricated and passed carefully into the bowel, as any roughness will cause a contraction and defeat the purpose. If it meets with an obstruction, wait until a spasm ceases and then try again. If difficulty is met with let a little water pass in to distend the gut and try again. Pass it in eighteen inches or more.

The tube is then or has previously been attached to a Y tube, to the other two limbs of which are attached the fountain syringe and the drainage tube. The bag contains for a simple irrigation plain water or better a physiological salt solution, a level teaspoonful of salt to the pint, at a temperature of 100° F. It should be held about three feet above the level of the patient's body. The water is allowed to flow in and out, by alternately pinching the outflow tube and the inflow tube. Discomfort on the part of the patient tells when enough has been introduced at any one time.

If irrigation of the lower part of the intestine alone is aimed at, a two-way tube like the Kemp tube is a great convenience.

About two quarts may be used at a time; in some cases, even more.

The irrigation may be followed by an astringent.

The best astringent is silver nitrate. It should be used in increasing strengths, 1 to 2,000 at first and increasing up to 1 in 500 or 1 in 400 or 300.

Use one or two pints. It may be introduced through the same syringe and tube. The tube should be pinched to keep the solution in contact with the bowel a few minutes or left in for the patient to pass.

If salt solution is used at first, it must all be discharged or the silver will be neutralized by it.

In this case, if such difficulty is constantly met with, use plain water. If the solution of silver gives great pain it is too strong and may be neutralized by salt solution.

The treatment may be tried daily in the weaker solutions and then less frequently. Intermit the treatment occasionally to let the mucous membrane recover from any irritation by the silver that might have been excessive.

These protracted cases are often due to ulcers which will not heal under this milder application; hence, an effort should be made by the aid of the proctoscope or sigmoidoscope to detect and treat directly any ulcer within reach. Here strong silver in 25 per cent. solution or the stick may be used.

There are two other important matters to be taken into consideration in the treatment of chronic dysentery—namely, change in environment and the diet.

What those subtle influences are that determine improvement in a new environment, seen in those patients fighting to overcome a lingering infection of one kind or another, defies analysis at present.

While climate, fresh air, sunlight and other physical conditions may be appealed to, they are not always sufficient. The effect upon the mind induced by a change certainly has something to do with the results. I recall a bitter struggle with dysentery, occurring in a patient attacked away from home, dragging out to eight or ten weeks in whom the home-going, though effected on a stretcher, brought health and strength in a manner little short of the miraculous, and such examples every practitioner of medicine can recall.

Diet in the prolonged or chronic cases is an important problem.

During the progress of this disease the patient loses much flesh, to which the low diet adopted to spare the inflamed bowel, has been a factor.

Loss of body substance in infectious diseases is due to (1) pyrexia, (2) toxemia, and (3) starvation. Now, in these prolonged cases the fever has waned and the signs of general toxemia, other than the residual weakness, have subsided, and because the patient has still too many loose stools with mucus, he is kept on the same restricted diet.

The diet is milk, perhaps two quarts of it with about 1,280 calories and 70 grms. of proteid. Now how can a man, whose daily needs are well over 2,000 calories, make up 1,000 deficit out of his own tissues day after day and still afford energy enough for successful resistance and repair? The proposition is absurd, and I am convinced that in a large percentage of these cases that drag along, starvation is at the bottom of it.

I look through dietary after dietary and see milk, cautiously a little egg and still more cautiously a little scraped meat offered, and no mention made of the use to which the carbohydrates could be put. I do not think we should be alarmed at the addition of a little sugar to the milk, and, if we fear fermentation, we can add milk-sugar which is not easily fermentable. Every ounce is worth 120 calories and we could add three ounces to the two quarts of milk without provoking trouble or even distaste.

I cannot see why the cereals should not be used—barley, rice, farina, bread and butter, cereal soups; eggs may be given, each worth 60 to 70 calories. A small chop is easily digested and modern physiology emphasizes how easily proteid is digested and assimilated and there are 100 calories more.

Beef, mutton, chicken, and potatoes leave but little residue, and if the patient does well on this more liberal diet, give him some of the green vegetables, puréed at first—peas, or small stringed beans—and let us see if they do not improve rather than aggravate the condition.

What should be emphasized is that the body may suffer more from the absence of food than the intestine from its presence. That when the acuteness of the process has subsided, one should consider the dietary needs of the patient, and see that he gets it, at first in food that leaves but little residue, and then permitting other foods little by little. We are humiliated sometimes to find that these chronic cases improve when first they escape our hands.

Prophylaxis.—The bacillus seems to be water-borne, and so when an epidemic occurs the same precautions should be taken as in that other water-borne infection—typhoid fever. Water should be boiled, milk inspected or boiled, green vegetables thoroughly cleaned. Infection, too, may come from contact, and the stools should be destroyed and clothes treated in the same manner as in typhoid.

HEMOCHROMATOSIS WITH DIABETES.

By WARREN P. ELMER, M. D., of St. Louis,
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Hemochromatosis with diabetes or "Bronze Diabetes" has been known to pathologists and clinicians almost thirty years, yet less than 40 cases have found their way into the literature.

The following case offered exceptional opportunities for study:—J. M., German, married, aged forty-six, marble polisher by occupation, came under observation December 29th, 1908, complaining of cramping pains in the leg muscles, slight pain in testicles, headache, thirst and weakness.

Family History.—One sister died of tuberculosis, otherwise no data of importance.

Personal History.—Patient was strong and well as a child, gonorrhea followed by a stricture at eighteen, otherwise well until the beginning of the present illness.

Present Illness.—Two years ago patient began to notice that he was becoming weaker and that his appetite was failing. He consulted a physician under whose care he improved considerably for a time, but never regained his normal strength. He continued his work, however, without much difficulty. About a year ago he began to notice pains in the leg muscles. These pains were cramping in character, would last for an hour or two and then disappear for days or even weeks. About this time his wife noticed that his color was becoming "sallow" but not noticeably darker.

This condition continued, the pains becoming somewhat more frequent and severe until about December 1st, 1908, at which time the patient first noticed that he was developing an unusual thirst with increasing frequency of urination. The weakness became more pronounced and dull headache developed. Friends began to comment on his dark skin about this time. A few days later his ankles began to swell and some pain developed, especially after standing for a time. The leg cramps became more severe, and the patient was obliged to stop work about December 25th, 1908. Four days later he came to the Medical Clinic of St. Louis University.

Habits.—The patient drank from one to two glasses of beer a day for years until a month before coming to the clinic; since then he has used no alcohol of any kind. He used tobacco to excess until two years ago; since then he has smoked one or two cigars a day. He has always eaten and slept regularly. His sexual habits were moderate, but during the past year his sexual power has diminished somewhat.

Physical Examination.—December 29th, 1908, 11 a. m. Temperature 99° F.; pulse 84, regular. Blood-pressure 150 mm. by Stanton's sphygmomanometer. Radial artery somewhat thickened. Weight 140 lb. Height 5½ feet.

The patient is fairly well-nourished and looks about the age stated. His hair, light brown, is thin, very soft and silky. The skin of the head and face is of a peculiar bronze-brown color, dry and somewhat scaly. This bronzing is more marked about the eyes and over the prominent portions of the cheek. The facial expression is dull, almost apathetic. The lips and ears are very slightly cyanotic. There is no evidence of pigmentation on the lips, gums, tongue or buccal mucous membrane. The teeth are poor; tonsils and pharynx normal.

The neck shows a more marked bronze color than the face. The thyroid shows no enlargement. The chest is well formed. The skin is not so dry as on the exposed portions of the body. The pigmentation shades off below the clavicles to a light brown except about the nipples and axilla where it is very dark. The skin of the arms resembles the chest, but the forearms and hands are very dark; the skin is thick, dry and inelastic, so much so in fact that the outer layer can be cracked by pinching it.

The abdomen shows marked pigmentation about the umbilicus. The genitals are almost black, as is also the anal region and the thighs close to the genitals. The remainder of the thighs shows little discoloration. The popliteal spaces are pigmented over an area about the size of the hand. The legs show marked pigmentation over the tibias. The feet are somewhat pigmented, but not so intensely as the hands; neither is the skin so thick nor so inelastic.

The respiratory excursions of the chest are regular and equal, but somewhat diminished in extent. Litten's shadow measures 3 inches on the right and 2 inches on the left, in the midaxillary line. The cardiac impulse is most marked in the fifth intercostal space, 4½ inches from the mid-sternal line. It is rather quick and slapping in character.

The abdomen is somewhat fuller on the right side below the costal margin, but elsewhere seems rather retracted. The superficial vessels are not enlarged. The genitals appear normal. The ankles slightly edematous.

The palpable cardiac impulse is rather weak and quick. Vocal fremitus somewhat diminished, but equal on the two sides of the chest. The liver can be felt about a finger's breadth below the costal margin; it is smooth and not especially firm. The spleen can be felt at the costal margin; it is smooth and soft.

The absolute heart dullness measures 2½ by 2 inches. Pulmonary resonance is normal. The absolute liver dullness begins at the sixth rib and extends a finger's breadth beyond the costal margin in the mid-clavicular line, and to the left as far as the midsternal line. The splenic dullness extends about a finger's breadth beyond the costal margin. There

is no increase of dullness in the flanks. The abdomen on the whole is tympanitic.

The first sound of the heart is somewhat shorter than normal and the aortic second sound is accentuated. Auscultation of the lungs reveals nothing beyond slight emphysema.

Examination of twenty-four-hour-specimen of urine on December 30th showed quantity 4,000 c.c., specific gravity 1,032, acid reaction, color dark brownish-red. Albumin $\frac{1}{4}$ per cent. by Esbach method, sugar 6 per cent. by Lohnstein method, free hemoglobin in considerable quantities. The sediment contains red blood-cells, hyaline-and granular casts.

Blood examination on the same date showed hemoglobin 70 per cent. by Dare's hemoglobinometer; red blood-cells 3,800,000, leukocytes 6,800. The differential count of the leukocytes showed polymorphonuclears 70 per cent., small lymphocytes 22 per cent., large mononuclears 6 per cent., mast cells and eosinophils of each 1 per cent. There was no evidence of lipemia.

A small piece of skin was removed from the forearm for pathological examination.

Report on skin section removed on December 30th, 1908, by Dr. R. L. Thompson, is as follows:—Section of skin from arm (reaction for ferric salts with ferrocyanide of potassium and acid alcohol after lithium carmine) shows a large amount of yellowish fine granular pigment in the epithelial cells. This is probably, to a considerable extent, the increased normal pigment of the stratum germinativum of the epidermis. Similar pigment is occasionally seen in the cells of the stratum filamentosum. There is also to be seen a coarser granular pigment in the epithelial cells of some of the sweat glands, and occasionally a few granules are found in the connective-tissue. This latter pigment is colored a rather bright bluish-green with the above stain.

On January 3rd, 1909, the patient entered Rebekah Hospital. He was given carbohydrate free diet for three days. During the second twenty-four hours the urine quantity fell to 1,800 c.c., the specific gravity to 1,028, sugar to 2 per cent. During the third twenty-four hours the urine measured 1,200 c.c., specific 1,026, sugar $\frac{1}{2}$ per cent., acetone and diacetic acid in small quantities in both samples. Free hemoglobin was present as on previous examinations.

The patient was placed on Von Noorden's oatmeal diet, and for three weeks the quantity of urine varied from 1,000 to 1,260 c.c.; in twenty-four hours the sugar from $\frac{1}{4}$ to 1 per cent. The albumin, hemoglobin and casts, however, remained constant, and free blood was always present. During this time the patient improved both in strength and spirits, his weight increased to 148 lb. Repeated examination of the stools during this period revealed nothing abnormal.

On January 13th a von Pirquet test was made. The abrasions were examined at the end of twenty-four and forty-eight hours but showed no reaction.

The patient left the hospital January 29th without change in his physical signs but feeling much more comfortable. The diet was continued, adding celery, meat and spinach.

At the end of a week patient came to the dispensary, feeling somewhat weaker. The urine was not materially changed, but on physical examination the abdomen was found to be slightly distended, and there was dullness in the flanks, which shifted on change of position.

The following week the abdominal distension was increased, and the dullness in the flanks, increased to the anterior axillary line, could be readily shifted with change of position. The urine had increased to 2,000 c.c. in twenty-four hours, the specific gravity was 1,030, sugar 2 per cent. The patient gave a history of eating excessively of the oatmeal. He was advised to re-enter the hospital, but decided to wait a week. He was given directions to take carbohydrate free diet for two days, then resume the oatmeal in reduced quantities.

On February 23rd, 1909, patient re-entered hospital. He complained of slight dimness of vision and the eyes were examined by Dr. A. S. Steiner, who reported them normal except for slight presbyopia.

On February 24th Dr. J. W. Marchildon made tests of the hemolytic power of the patient's blood. The results were as follows:—

- (a) Patient's red blood-cells with patient's serum show no hemolysis.
- (b) Patient's red blood-cells with normal serum show no hemolysis.
- (c) Patient's red blood-cells with normal salt solution show no hemolysis.
- (d) Normal red blood-cells with patient's serum show no hemolysis.
- (e) Normal red blood-cells with normal serum show no hemolysis.
- (f) Normal red blood-cells with normal salt solution show no hemolysis.

The quantity of the patient's urine on the same day was 720 c.c., dark reddish-brown in color, specific gravity 1,030, albumin 1/10 per cent., sugar 2 per cent., casts and red blood-cells as in previous examinations. The physical examination on February 24th showed the abdomen to be greatly distended. Dullness extended to the midclavicular lines on both sides. Fluctuation was easily demonstrated. The liver dullness extended only to the costal margin. A few ecchymotic spots about 1 cm. in diameter were noted on the legs. The patient, except for increasing weakness and the discomfort caused by the abdominal distension, said he felt as well as before leaving the hospital.

During the next two weeks the patient was freely eliminated and the abdominal distension diminished slightly. The urine quantity, however, could not be increased beyond 1,100 c.c. in twenty-four hours, and most of the time was below 900 c.c.

On March 13th, it was considered advisable to do a paracentesis. Six litres of dark reddish-brown fluid were withdrawn. This fluid had a specific gravity of 1,012, contained little fibrin, but albumin was abundant. $\frac{1}{2}$

c.c. of this fluid caused a well-marked reduction of Fehling's solution. The sediment was stained and differential count of the cells resulted as follows: Small lymphocytes 70 per cent., polymorphonuclears 25 per cent., large lymphocytes 5 per cent. The fluid contained a considerable amount of free hemoglobin and red blood-cells were numerous.

The urine examination twenty-four hours before the paracentesis showed: quantity 400 c.c., specific gravity 1.027, albumin 1/10 per cent., sugar 3 per cent., free hemoglobin, but no acetone or diacetic acid. Casts and red blood-cells were numerous in the sediment. After paracentesis the liver could be felt at the costal margin.

For the next ten days the patient was more comfortable, but became steadily weaker. The urine quantity was not above 800 c.c. in twenty-four hours.

The blood on March 18th contained 3,800,000 red cells and 4,950 leukocytes per cubic millimetre. Hemoglobin was 70 per cent.

On account of the weakened condition of the patient all attempts at diet were discontinued on March 20th. The patient was given milk, eggs and a little bread. Sodium bicarbonate in $\frac{1}{2}$ drachm doses was given every four hours.

On March 25th paracentesis was again performed and five litres withdrawn. This fluid resembled that previously examined except that the reaction for sugar was even more pronounced.

The urine on March 28th measured 780 c.c. in twenty-four hours, albumin 1/20 per cent., sugar 2 per cent., acetone and diacetic acid present in small quantities.

From this time on the patient's condition grew rapidly worse. He complained of no pain, but was too weak to sit up in bed for nourishment. He became stupid, answering questions with difficulty. The abdomen filled rapidly, and on March 31st four litres were withdrawn which resembled in all respects that withdrawn on March 25th. The urine was voided involuntarily after March 31st, but was apparently greatly reduced in quantity.

Respiration became labored, the temperature dropped from normal to 96.5° F., where it remained in spite of stimulation. On April 2nd the patient became comatose, pulse and respiration gradually failed, and he died on April 4th.

AUTOPSY PROTOCOL.

The report on the autopsy and histological findings by Dr. R. L. Thompson is as follows:—

Body of a fairly well-developed, poorly-nourished male. Face and neck dark brown (bronzed) in color, shading off over clavicles to lighter brown. This brown color includes also forearms and hands. The genitals are almost black in color. The lower limbs are not so much involved,

but brown pigmentation quite marked in popliteal spaces and over tibiae. In these latter places are also numerous ecchymoses and several discrete pigmented areas, about $\frac{1}{2}$ cm. in diameter. Some increase in pigment is seen about umbilicus. Abdomen shows three pigmented scars below umbilicus (paracentesis scars).

Abdominal cavity.—Paniculus adiposus fairly thick; infiltrated around central puncture with blood-stained fluid. Peritoneal cavity contains two litres of blood-stained fluid. Intestines dark bluish-red in color and somewhat matted together with fibrinous adhesions, which are easily separable. Lower edge of liver one finger's breadth above costal margin.

Pleural cavity negative. Lungs negative save for congestion and edema.

Pericardium negative. Heart, weight 300 grms. Left ventricle 2 cm. in thickness, firm, dark red in color. Endocardium, myocardium, and valves appear normal. Coronary arteries show slight sclerosis.

Liver.—Weight 1,780 grms. Surface shows typical "hobnailed" appearance and is dark brownish-red in color. Gall-bladder and ducts normal.

Spleen.—Enlarged. Weight 400 grms. Fairly soft in consistence. A few scattered patches of fibrous thickenings appear on surface. Section shows increased size of Malpighian bodies; some pulp adheres to the knife on section; trabeculae prominent but somewhat obscured by pulp.

Pancreas is enlarged. Weight including considerable adherent fat 150 grms. Consistence apparently diminished. It is irregularly invaded by yellow fatty tissue and gray fibrous trabeculae. The organ exhibits a dark brown color where this fat is lacking. On section the organ is deep seal-brown. Pancreatic artery tortuous and sclerotic. Tail of pancreas is firmer than head and shows normal lobulations.

Lymph-nodes.—The retroperitoneal lymph-nodes, especially in the region of the pancreas, are enlarged, firm and chocolate-brown in color.

Kidneys.—Weight, 310 grms.; appear about normal in size. Capsule slightly adherent, but leaves smooth surface on stripping. On section organs show marked congestion with clear differentiation of cortical and medullary portions. Cortex measures 6 mm. Adrenals negative. Bladder negative.

Intestines.—The mucosa of both large and small intestines is slate colored. Stomach negative save for similar slate color of mucous membrane.

Arteries.—The aorta is fairly normal, but shows a few yellow atheromatous patches. There is, however, marked sclerosis of the mesenteric vessels, especially the splenic and pancreatic arteries.

ANATOMICAL DIAGNOSES.

Edema and congestion of lungs. Acute fibrinous peritonitis. Chronic interstitial pancreatitis. Chronic interstitial hepatitis. Chronic inter-

stitial splenitis. Chronic interstitial nephritis. Arteriosclerosis (moderate). Pigmentation (hemochromatosis) of skin, liver, pancreas, spleen, kidney, lymph-nodes, blood-vessels, and intestines.

MICROSCOPIC REPORT.

Sections treated with ferrocyanide of potassium and acid alcohol, after staining with lithium carmine, show the following:—

Heart.—There is a widespread infiltration of moderately-coarse granular pigment within the muscle-cells throughout the organ, only a part of which stains bluish-green. All of the cells are not equally affected; some are completely filled with the pigment and some contain only a few granules. The distribution is to a certain extent in patches, areas of the muscle containing little pigment alternating with areas containing a great deal of pigment. Only a relatively small amount of pigment is found in the interstitial tissue of this organ.

Liver.—The organ shows a marked increase in the interlobular connective-tissue and moderate atrophy of the liver cells (typical chronic interstitial hepatitis). The interstitial tissue is everywhere loaded with pigment masses which react to the ferric stain. In addition the liver cells themselves are practically everywhere more or less completely filled with this pigment. Masses of the pigment are found, moreover, within the capillaries between the cords of liver cells.

Spleen.—The organ shows a marked increase of connective-tissue throughout (chronic interstitial splenitis). The Malpighian bodies are poorly defined, and the vessels of the same show hyaline degeneration of the walls. Throughout the organ small masses of the bluish-green staining pigment are seen. With the high power, fine pigment granules are to be seen in considerable numbers in every field in addition to the larger masses.

Pancreas.—The pancreas also shows a considerable increase in the interstitial connective-tissue (chronic interstitial pancreatitis). The islands of Langerhans are in general fairly-well preserved, but some show increase of fibrous tissues along their capillaries. These cells also contain a considerable amount of pigment. The interstitial tissue in this organ is also everywhere filled with iron containing pigment, as was described in the liver. The epithelial cells generally contain pigment; sometimes only a few granules, but more frequently large masses completely obscuring the cell.

Lymph-nodes.—Sections from mesenteric lymph-nodes show only occasional islets of lymphoid tissue, the greater part of the section being composed of innumerable closely set masses of coarse granular pigment which reacts to the ferric stain.

Kidney.—In the kidney, which shows moderate increase of connective-tissue in the cortex, there is less pigment than is found in other organs,

Occasionally, however, a convoluted tubule is found, the epithelium of which is filled quite completely with coarse granular bluish-green pigment. In the pyramids practically no pigment is seen.

Intestine.—Sections of intestine show a considerable amount of fine yellowish (iron free) pigment scattered diffusely through the muscularis and submucosa. In the mucosa larger masses of coarser pigment are found within the epithelial cells which in part react to the ferric stain.

Muscle.—Section of striped muscle (rectus abdominis) shows no pigment.

Blood-vessels.—The walls of the larger blood-vessels, both veins and arteries, show fine granular yellowish pigment which does not react to the ferric stain. This pigment appears in both the media and adventitia, and is usually in the smooth muscle and connective-tissue cells.

General Considerations.—The etiology of bronze diabetes and hemochromatosis has been the subject of speculation since the report of the first cases by Hanot and Chauffard¹ in 1882. These, and other observers of the French school, considered that diabetes was the primary disease; the result of this diabetes being a destruction of the red blood-cells, with consequent formation of pigment from the iron thus liberated and its subsequent deposition in the skin, liver and pancreas. The presence of this pigment, they thought, gave rise to chronic interstitial inflammation.

Von Recklinghausen,² in 1889, made a study of bronze diabetes, as well as certain other conditions where similar pigment was present without glycosuria. He concluded that the pigment was derived from the blood, and described two distinct varieties, one containing iron, which he termed "hemosiderin," and the other containing no iron, which he termed "hemofuscin." The location of these pigments he described in detail. To all these conditions whether complicated with diabetes or not he gave the name "hemochromatosis." For some years following, the French refused to associate hemochromatosis with bronze diabetes.

Marie³ thinks that following some primary etiological factor the hemoglobin of the blood is transformed by the body cells into pigment. This pigment, he thinks, causes the destruction of the cells in which it is deposited and produces interstitial inflammation. Bronze diabetes he considers a peculiar form of diabetes but associated closely with the pancreatic form. Acard,⁴ Dutournier,⁵ and Jeanselme⁶ support this view and suggest that the interstitial pancreatitis is the cause of the glycosuria. Anschuetz⁷ is also in accord with this idea.

Opie,⁸ in 1899, reviewed all published cases, and reported one of his own. He comes to the conclusion that diabetes is the terminal event in hemochromatosis and appears, he thinks, after the interstitial inflammation has obliterated a large number of the islands of Langerhans. His case he thinks died before such a stage was reached.

In the case here reported the diabetes probably preceded the liver

cirrhosis. This cannot be considered, however, as a fact in favor of the original theory. Many cases show cirrhosis of the liver well marked before diabetes begins. There is no reason to doubt that the interstitial inflammation may first appear either in the liver or pancreas, or, granted that it begins simultaneously in both organs, advanced more rapidly in one or the other due to the individual susceptibility to such change.

The question as to what causes this deposit of pigment has been variously answered. Most authors agree that it must come directly or indirectly from the blood. Some authors report moderate grades of anemia in these cases. Anemia, however, is not constant and often appears late in the disease. Hess, and Zurhelle,⁹ with some of the more recent French observers, believe that some unknown toxic substance causes increased hemolysis; and, in support of this, mention the anemia, hemoglobinuria and purpuric spots which appear in some cases. Fletcher¹⁰ agrees with this theory. Meltzer,¹¹ on the contrary, cites the cases where no anemia was present and contends that there is no increased hemolysis. Berg¹² believes that there is some disturbance in the metabolism, which prevents the elimination of the iron from the red cells normally destroyed.

The work of Dr. Marchildon, in testing the hemolytic power of the blood of this case, seems strong evidence against the theory of increased vulnerability of the red cells and makes the contention of Berg more plausible. The belief of Simmonds¹³ and others that alcohol is the chief etiological factor, seems not to be well founded. Fully one-third of the reported cases do not give a history of the excessive use of alcohol, and the large numbers of alcoholics with cirrhosis of the liver, but without pigmentation, also argues against this theory.

Whether the derangement in the metabolism, which most authors agree brings about hemochromatosis, is due to an intoxication cannot be proved or disproved until our knowledge of metabolism has advanced far beyond its present state.

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SOME GENERAL CONSIDERATIONS IN REGARD TO RIGHT
HYPOCHONDRIAC PAIN.

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The 'diagnostic study of a case from the standpoint of the chief complaint or presenting symptom has the disadvantage that one is depending upon a subjective manifestation, the expression of which is modified by the character of the patient. Exaggeration of symptoms, as well as malingering, may lead to error in judgment. There are well-known methods, however, by which overstatement or attempts at deception may often be interpreted in their proper terms. Suspicion may be aroused by an increased sensibility to minor inflicted pain, or by an increase of knee-jerk not accounted for by the presence of organic disease. Perhaps, in an apparently paralyzed limb a contralateral reflex may be observed. In other words, by a thorough study of the psyche of the patient, by the recognition of the presence of the stigmata of hysteria, or by the carrying out of various methods by which a pseudo-sufferer may be detected in his attempt to deceive, diagnostic pitfalls may be avoided. It is needless to say, that information received from persons other than the patient is often illuminating.

Case I.—N. T., female, *aet.* thirty-two, is markedly psychasthenic. This patient complains that she menstruates almost constantly, and that sometimes weeks will pass without her having a bowel movement. On being placed under observation it was found that her menses were of the twenty-eight-day type, and that she had a daily fecal evacuation. At another time, she complained of severe right hypochondriac pain. Other symptoms and signs were present which made the diagnosis of gall-stones a probable one. There was in addition evidence of the presence of chronic appendicitis. An adherent appendix was removed, and several gall-stones were taken from the gall-bladder; the patient claimed to have received no relief from the right hypochondriac pain. She was told that she was now suffering from a habit pain; but she was unconvinced, and stated that when her bowels moved, stones would fall into the bed-pan like hail. She supported this statement in the face of evident disbelief by bringing a large number of ordinary pebbles for examination. In spite of the fact that her attempted deception has failed, there is still complaint of severe pain in the region under consideration.

Such attention-pain, according to Dana's¹ admirable interpretation, is real pain in spite of the fact that the sensory stimuli have dropped to normal. Owing to a lowered threshold of consciousness, ordinary stimuli now pass within the region of cognition, and, the attention of the patient

being directed to these stimuli, they are registered as pain. The recognition of the type of pain present is of paramount importance from the standpoint of therapeutic relief.

That pain is often salutary, in that it leads a sufferer to seek medical advice and to undergo proper treatment directed to the removal of its cause, is a matter too well recognized to require amplification. The following cases exemplify the difficulty with which patients are handled where this compelling force is not present to a marked degree.

Case II.—M. E. V., female, *aet.* fifty-one, was seen March 31st, 1911, suffering with severe right hypochondriac pain. There was nausea and occasional vomiting. The region over the gall-bladder was tender, and there was pronounced local muscle-spasm. Subsequently there developed typical, mild obstructive jaundice with a slight rise of temperature, and a moderate leukocytosis. There had been no previous attacks of pain, and the patient's history was otherwise negative except in that she had suffered from a long continued train of dyspeptic symptoms. Operation was advised, but was refused for a considerable period on account of the absence of pain. The patient's objections were finally overcome, and an operation was performed. The gall-bladder was surrounded by recent adhesions, and contained many stones, one of which was wedged at the entrance of the cystic duct. The bile gave a pure culture of *B. coli communis*.

Case III.—C. M. F., female, *aet.* fifty-six. Chief complaint: paroxysmal hematuria. First attack two and a half months previous to her admission to the St. Francis Hospital. During the last few months, there had been a slight loss in weight. There had never been any pain except in the bladder at a time when it was full of clots. Examination of the abdomen disclosed a movable and apparently irregular mass which corresponded with an enlarged right kidney. This could be pushed well below the examining hand. The hemoglobin was 85 per cent. The patient's general condition was good, but she was markedly psychasthenic. Catheterization of both ureters was performed by Dr. Huggins, and blood was seen to be issuing from the right ureter. The character of the urine obtained from the two ureters was as follows:—

Right.—Acid; albumin present; red blood-corpuscles many; white blood-corpuscles present; no casts.

Left.—Acid; albumin present; red and white blood-corpuscles a few; no casts.

Previous examination had resulted in the following findings:—

Right kidney excreted 17 c.c. in one hour.

Left kidney excreted 20 c.c. in one hour.

Right-kidney urine contained 0.8 per cent. urea and left-kidney urine 1.6 per cent.

Indigo-blue test.—Right-kidney urine after one hour: colorless. Left-kidney urine after eighteen minutes: color slight—after twenty-one minutes: fair—after twenty-eight minutes: marked.

After consultation with Dr. Huggins and Dr. R. T. Miller, Jr., a diagnosis was made of disease of the right kidney, probably malignant in character (hypernephroma), and immediate exploration was advised. Had the patient been suffering severe pain, it is probable that the advice given would have been followed. The patient, however, refused to recognize

the urgency of her condition, and left the hospital stating that she would probably submit to the operation later, after she had recovered strength.

It is interesting to note that in growths of the kidney, pain appears late, if at all. Thus Israel as quoted by Johnson,² states that pain is usually absent in malignant disease of the kidneys except at such time as clots may be passing through the ureters, or when the growth has reached such size as to produce pressure-symptoms. As women have more lax abdominal walls than men, he states that the former seldom have such pressure-symptoms until an inoperable stage has been reached. To this fact he attributes the high mortality of the disease in women. This insensitiveness of viscera to ordinary stimuli, as insisted upon by Mackenzie³ and others, may explain the absence of pain in many conditions of the heart, stomach, liver, kidneys and pericardium, in which its presence would be of diagnostic aid.

In considering the significance of pain in the right hypochondriac region, one is struck with the comparative frequency with which such pain originates in a distant organ. The theory of Head that centripetal impulses originating in insensitive organs are reflected to the periphery through the segment of the cord at which they are received, and more especially the vascular crisis hypothesis as advocated by Pal, explain many, but not all, of these transferences. The important clinical fact is that many pains which have their maximum in the right hypochondrium may be due to diseased condition in the lungs, in the pleura, and in other more or less remote structures.

A detailed enumeration of the various conditions, which may induce right hypochondriac pain, would be wearisome; a consideration of the various diagnostic problems involved would be manifestly impossible within the limits of a brief paper. It is obvious, however, that in practice we should keep in mind a list of all possible causes of such pain, and it is important that we should be alert to notice all manifestations even of an apparently trifling nature, which might turn a scale of probability from one source of pain to another. In certain of the conditions which may produce right hypochondriac pain, diagnosis without exploration or autopsy may be difficult or impossible. As a rule, however, careful observations, logical reasoning, and perhaps some imagination will solve the problem. An occasional glance at such charts as those of Head or of Schmidt⁴ may be a useful reminder even to the adept, since he will find at times that memory has failed him, and that he may have overlooked a condition fairly crying for recognition.

The full utilization of such aids as the laboratory may afford will often make a diagnosis possible even where the condition is, at first, baffling. Thus, a cell count of the spinal fluid or a positive Wassermann reaction may clear up the diagnosis of a syphilitic liver. In certain other instances, a final diagnosis may be arrived at only by observing the further course of the disease-process.

Case IV.—Mrs. J. H. M., *act.* sixty-three, was operated upon for cancer of the right breast in November, 1907. The diagnosis was confirmed by microscope. Two years subsequently she developed a dragging sensation in the right hypochondrium, which suggested the possibility that a metastasis had taken place. A study of the patient's symptoms in connection with a physical examination showed that in addition to an enlarged liver there was a weak myocardium, with relative mitral insufficiency and venous stasis. The surface of the liver was smooth, and there was absence of evidence of portal and biliary obstruction. There was, apparently, no carcinomatous involvement of other organs. It was decided, therefore, that the condition was probably due in part at least to venous stasis dependent upon cardiac decompensation. This position was subsequently secured by the fact that the size of the organ lessened, and that the right hypochondriac discomfort disappeared when the stronger heart-muscle was able to maintain a better mass movement of blood.

In arriving at the cause of a given symptom, a knowledge of the relative frequency with which individual etiological factors might be present would be of great importance. Cabot⁵ has made a painstaking attempt to compare these in a graphic way, and his diagrams well repay study. This author admits the incompleteness, and relative inaccuracy of these diagrams; yet he has developed a means of study which is of great value and which is worthy of amplification.

It is a well-known fact that gall-stones are found with great frequency upon the operating table, and at autopsy. In 11,333 post-mortem examinations made at Guy's Hospital, Hale White found them in 3 per cent. of adult patients. Mayo⁶ has recently estimated that one-half of one per cent. of individuals of all ages have gall-stones, and that 5 to 8 per cent. of women and 2 to 4 per cent. of men have gall-stones after the age of fifty.

In spite of a knowledge of such statistics, and of a clinical experience which points to the great preponderance of gall-stones as a cause of pain in the upper abdomen, one is struck by the relatively extraordinary length of the line at the head of that diagram in which Cabot endeavors to represent the relative frequency of various causative factors of pain in the right hypochondriac region. Cabot's statistics show that cases of gall-stones and cholecystitis are the origin of such pain in 648 out of a total of 781 instances. The same author finds gall-stones to be causative in 329 instances out of 1,663 cases of pain in the epigastrium. Mayo⁶ says that in his experience the colic of simple gall-stones is usually most intense in the epigastrium. This divergence eloquently testifies as to the admitted fallibility of statistics based upon a patient's description as to the location of pain. The diagram has nevertheless justified itself. It has carried home its lesson that, in the production of pain in the upper left and central abdomen, the gall-bladder and its possible foreign contents are overwhelming factors.

Any conception as to the value of pain as a diagnostic clue would be inaccurate, were one to ignore the fact that pain is frequently absent in

severe conditions in which one would naturally expect severe physical suffering to be a marked and constant feature. This absence of localized pain may be due to a variety of causes. Reference has already been made to the insensibility of certain organs to ordinary painful stimuli. In other instances, marked bodily discomfort—an overshadowing pain elsewhere, for example, or the presence of the subjective symptoms of a circulatory breakdown—may make the local manifestation appear of so trivial a nature that it may be entirely overlooked in the anamnesis. To such a group, belong those causes of passive congestion of the liver in which one finds an enormously distended organ, but an hepatic condition entirely latent in so far as the production of subjective symptoms is concerned.

Case V.—G. H. H., male, *aet.* thirty-two, was admitted to the Pittsburgh Hospital for treatment for a harassing cough and urgent dyspnea. His cough was so troublesome and constant that the patient had been practically without sleep for several days. He was found to have an enormously dilated heart with general venous stasis. The primary condition was a rheumatic endocarditis and myocarditis, the former being localized especially at the mitral valve. The lower border of the liver reached to the level of the umbilicus at the midclavicular line; yet the patient said he had never had any discomfort over the enlarged organ.

Finally, a patient may be so mentally clouded by toxic or other processes that sensory stimuli may be unregistered in his sensorium. Fortunately, the importance of the repeated physical examination of such patients is generally conceded, and is now fairly generally practised. Only too frequently, however, failure of the patient to complain of pain, results in the failure of the physician to recognize serious conditions. In still more aggravated instances, even in the presence of subjective symptoms which should call the attention of the practitioner to its presence, a local condition which demands prompt relief may be disregarded. The frequency of failure to recognize so common a condition as an over-distended urinary bladder, is a matter of general knowledge, and yet patients repeatedly enter hospital wards suffering from this condition.

Case VI.—C. M., female, *aet.* thirty-eight. Admitted to the Pittsburgh Hospital complaining of pain in the left infrascapular region, the hypogastrium, and along the spine. She presented a complete paraplegia. The urinary bladder was found to be distended to a point one inch below the umbilicus, and to contain 2,000 c.c. of urine.

Pathogenic processes in the right pleural cavity are very apt to develop in an insidious manner. The importance of a routine examination of both bases, and especially of the right base, has been so often insisted upon that the careful diagnostician is more apt to make the error of regarding with suspicion an area of dullness at the right base due to a high diaphragm, than to overlook an effusion.

Often in a carefully studied case, indubitable signs of effusion at the

right base will be detected in a patient who is making little complaint of local pain.

Case VII.—J. B. H., *aet.* seventy-three, had been under treatment for three weeks for suppurative cholecystitis with cardiovascular and renal complications, and a terminal pneumonia. Right hypochondriac pain had been marked during the first ten days, at the end of which time a peritoneal abscess had been evacuated by incision. Subsequently, cardiovascular and toxic symptoms were the more prominent features. The right hypochondriac pain was no longer severe, and was often absent. During this period, signs of the presence of fluid in the right pleural cavity suddenly appeared. The exploring needle revealed the presence of pus. A rib was resected, and a pyothorax evacuated by Dr. J. D. Singley at the Pittsburgh Hospital. The examining finger detected a large opening in the diaphragm through which the liver could be distinctly felt. The pyothorax had formed, and probably the subdiaphragmatic abscess ruptured during the period of comparative freedom from pain.

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THE FALLACY OF WARMED ETHER VAPOR.

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In recent literature, attention has been directed so forcibly to the necessity of warming anesthetics that one feels almost impelled to adopt some procedure that will accomplish this purpose. Davis¹ and Gwathmey² state in most emphatic fashion that the interests of a patient subjected to anesthesia are best conserved only when he is allowed to inhale a vapor that has been previously warmed. This preliminary warming is supposed not only to aid in preserving the general body temperature, but also to guard directly against refrigeration of the lung and consequent post-operative pneumonia.

In order to warm an anesthetic vapor, it is necessary to add to the already complex armamentarium of the operating-room another more or less complicated and expensive apparatus. We do not believe that such an addition is necessary. The whole question of warmed ether vapor or warmed vapor of any kind is fundamentally a question that has to do with the physics of gases, one which could be answered, indeed, by the fundamental laws of physics without any further experimentation. We need not consider the somewhat complicated laws governing density, pressure and temperature of gases, or the phenomena attendant upon vaporization. It will suffice to concentrate upon the one physical fact that the specific heat of gases is low. This statement signifies two things: First, that it takes only a small amount of heat to affect markedly the temperature of a gas, and, secondly, that a gas has small capacity for holding its heat. In other words, referring to the specific of gases as being "low" is analogous to referring to an individual's tolerance for carbohydrates as being low; he is profoundly affected by comparatively small quantities, and passes these quantities off rapidly, instead of holding and utilizing them as does the normal individual. We must assume then, according to the natural law, that even if we heated ether vapor to a considerable degree, the gas would lose practically all its heat before we could deliver it to the patient. Ether boils at about 97° F., and the resultant vapor cannot possibly be driven to a higher temperature, unless it is held under pressure. When ether vapor is driven through a very circuitous coil that is heated, it is for a time under slight pressure and may take on a degree of heat higher than 97° (as shown in our experiments), but the moment the vapor emerges from its field of compression, it expands and cools with astonishing rapidity.

In order to demonstrate the small capacity of ether vapor for heat, we carried out the following experiments (see Fig. 1). An ordinary laboratory wash bottle was filled about half full with ether. To the inlet tube there was attached the bulb of a Pacquelin cautery. By means of a rubber tube, the outlet flow was carried to a lead pipe, one meter long with one-half centimeter lumen, coiled up as a "worm." This lead worm was immersed in a beaker of water that was brought to and kept at the boiling point on an electric stove. Fixed on the distal end of the lead coil was a thick-walled rubber tube one meter long, with small slits cut in it at varying distances (10, 40 and 60 cm.) from the end of the lead coil. The water in the beaker was brought to a boil and then ether vapor was pumped through the coil gently, about eighteen times to the minute. As the ether vapor emerged from the heated coil, its temperature was

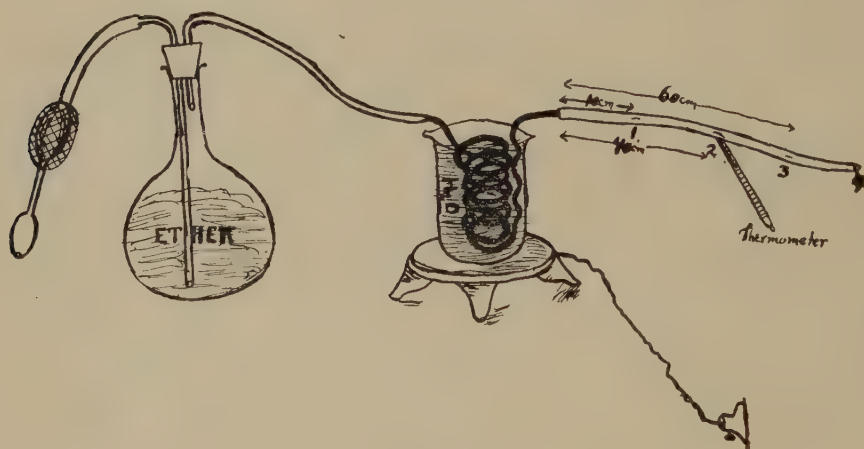


Fig. 1.

measured at the various distances along the tube by a thermometer, whose bulb was projected into the rubber tube, through the slits mentioned above. The experiment was carried on at a room temperature of 26.5°C . The ether vapor as it emerged from the end of the tube (1 meter from the site of heating) measured 26.9°C . If it was pumped through the coil violently and rapidly, it measured 28°C . As it emerged 60 cm. from the coil, it measured 28.9°C . At a point 40 cm. from the coil, it measured 28°C . At a point only 10 cm. from the coil it measured 30°C ., and on violent, rapid pumping, 52°C . In other words, despite the fact that the ether vapor was driven through a temperature approximating 100°C ., it radiated its acquired heat so rapidly that at a distance of one meter from the source of heat it had practically assumed room temperature.

We showed conversely that chilled vapor also tends to assume room temperature with great rapidity. If ether is vaporized rapidly the well-

known phenomenon of chilling occurs. We measured the degree of chilling by the simple apparatus shown in Fig. 2, and found that although the temperature at 2 could be forced down 10°C ., the ether vapor emerged at 4 at little below room temperature (0.5°C .).

These experiments only confirm the law of low specific heat of gases, yet they demonstrate rather forcibly the futility of warming ether vapor before delivering it to the patient. The experience of the tobacco smoker furnishes an equally emphatic confirmation of the rapidity with which gases lose their heat. The air drawn into the mouth of a smoker, over the glowing fire of a pipe or cigar, measures more than 500°F . (one physicist estimates it as $1,500^{\circ}\text{F}$.) when it is in contact with the fire; and yet when it reaches the sensitive buccal mucous membrane, it is not warm enough to produce a heat stimulus.

Of course, it must be granted that an experiment carried on *in vitro* cannot reproduce the phenomena which occur in the human body. In

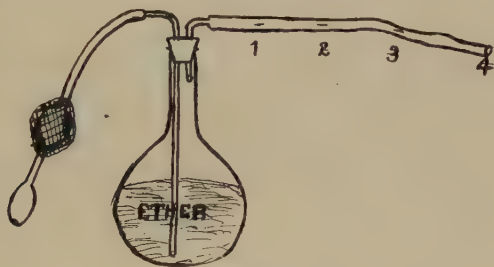


Fig. 2.

order, therefore, to test the question of lung refrigeration, the following procedure was resorted to. A dog was tracheotomized under local anesthesia, and a delicately calibrated thermometer inserted through the tracheal wound as far as the division of the bronchi. After a few minutes a reading was taken, and then ether was administered by the drop method. The column of mercury did not vary. Ether was then poured on the mask in very liberal quantities, so as to insure rapid evaporation and chilling, but even this procedure caused no drop in the column of mercury. After the animal had been under the anesthesia for some time a drop of 0.8°C . was noted, but this drop occurred also when the ether vapor was passed through hot water. The fact that the bronchial air is not lowered in temperature, despite the fact that the inspired air is cooler than normal, is explained by the normal rapidity with which the inspired air assumes room temperature, plus the fact that the warm nasal, pharyngeal and tracheal passages all tend to aid in the process of warming.

The experimental work of Hoffman³ demonstrates that it is practically impossible to measure with scientific accuracy the temperature of the inspired and expired air during anesthesia. But such measurements, from a practical point of view, are not necessary. We may rest content with

the simple fact that a warmed vapor will not stay warmed unless it is held under pressure. We have been led astray in our reasoning by the sight of ice crystals on the ether mask, or frost on the nitrous oxide gas cylinder. Indeed, we have been led so far astray, as to lose sight of one of the fundamental facts in the administration of anesthetics—namely, when ether is administered by the drop method, its rapid evaporation robs the surrounding atmosphere of latent heat, thus perceptibly cooling it. This cooled air can take up only a moderate amount of ether vapor by reason of the fact that it is cooled, and thus we are furnished with a safeguard against over-saturating the patient with ether. This physical fact it is, which has contributed so much towards making the open method of administering ether so safe and therefore so popular. If we bear in mind the rapidity with which vapors part with heat, we shall probably not concern ourselves much with securing special warming apparatus.

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INFLAMMATORY TUMORS PRODUCING INTESTINAL
OBSTRUCTION.*

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Considerable attention has been called in recent years to diverticulitis of the sigmoid loop of the large bowel, and in certain of these cases tumors of inflammatory origin have attained a considerable size. Similarly the appendix may be the seat of a chronic infection resulting in a tumor formation of such consistence and dimensions as to lead one to suspect new growth. Clinical experience has shown that while acute inflammation is exceedingly common in the right iliac region due to an infected appendix, we may likewise get acute diverticulitis of the sigmoid in the left lower abdomen. One has also observed that an infective agent which produces an appendicitis may synchronously originate a sigmoiditis. Thus recently I removed a gangrenous retrocecal appendix in a child fourteen years of age, and a few days subsequently opened an abscess in the left iliac fossa which ran a course quite independently of the trouble in the right iliac region.

Three of the cases I report to-day are of the chronic inflammatory type having their origin, in all probability, either in a chronic infection of the appendix or a similar infection of the sigmoid. The fourth case developed as the result of postpartum infection.

CASE I.—*Tumor in Pelvis resembling malignant growth of the rectum.* W. H., male, *aet.* forty-seven, had complained of progressive difficulty in getting the bowels to move for four months prior to consultation with me. When I saw him first with Dr. Meldrum, of New Durham, obstruction was almost complete, he suffered much pain after taking food, had occasional attacks of vomiting and after free purgation had passed fluid feces only. He had never passed blood or mucus. He had lost 15 or 20 lbs. in weight. On examination there was some distension, but a tumor was easily palpable in the left iliac fossa. Per rectum a mass was found filling the pelvis. His temperature was 101° F., pulse 92 and white blood-count 20,400.

On opening the abdomen in the middle line I found a mass in which the sigmoid and rectum were embedded (Fig. 1). Finding a line of cleavage I separated this from the pelvic wall on the left side. The terminal portion of the appendix was embedded in this mass. I removed the appendix and then endeavored to perform an inguinal colostomy, but

*Read before the Ontario Medical Association.

as the sigmoid was unusually short and there was no sigmoid mesentery, I divided the bowel transversely and secured a Paul's tube in either end (Fig 2). He made a good recovery with a fecal fistula. Three weeks subsequently I removed a portion of the mass by operation through the rectum and the pathologist reported it purely inflammatory in character. Eight weeks after the first operation I was able to pass a No. 10 English catheter from the lower sigmoid opening down through the anus, the distance by measurement between the two openings being exactly twelve inches. He returned to his farm in the country and came



Fig. 1.—Intestinal obstruction produced by an inflammatory tumor in the pelvis resembling new growth.

back greatly improved in health and I now found, three and a half months after performing colostomy, that the tumor had largely disappeared. I passed a large rectal bougie one inch in diameter through the lower segment of the bowel without difficulty; I then performed an end to end anastomosis at the seat of the colostomy operation. This was very readily accomplished over a rubber tube as recommended by W. J. Mayo (Fig. 3). He made an uninterrupted recovery and is now in perfect health.

CASE II.—*Tumor resembling sarcoma arising from the left iliac bone.* E. B., female, *aet.* twenty-two, had the appendix removed for acute infection five months before she consulted me. When she came under my observation she had a tumor in the left iliac region which she had discovered three weeks previously. There was a gradually progressive difficulty in getting the bowels to move. An ovoid mass regular in outline and firmly connected with the iliac bone extended upwards and inwards within two inches of the navel (Fig. 4). It was tender on pressure but no fluctuation could be detected. The temperature ranged from 99 to 100° F., pulse 80, the leucocyte count showed 18,000 white cells. The x-ray picture revealed a blurring in the region of the tumor but nothing more. She had lost weight to a considerable degree.

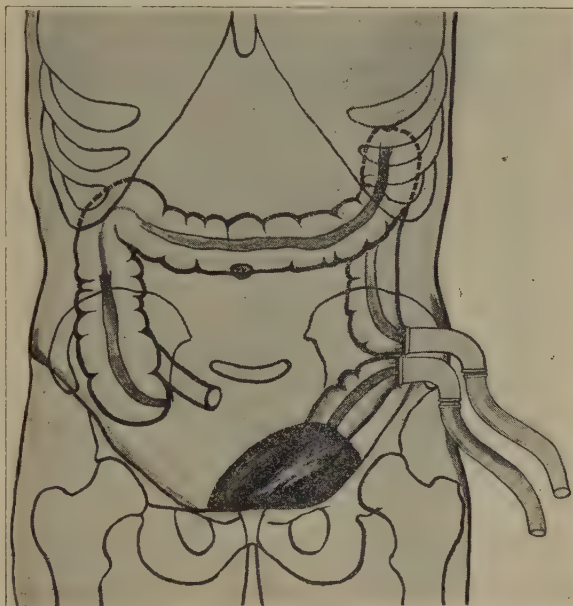


Fig. 2.—Fecal fistula formed by the use of 2 Paul's tubes for the relief of intestinal obstruction caused by inflammatory tumor.

On opening the abdomen the mass was found fixed to the bone in the left iliac fossa. Finding a line of cleavage it was separated from the bone and was now found to involve the sigmoid colon and was intimately adherent to the left broad ligament and the uterus. A portion of the tumor the size of a golf ball was removed. This left a raw bleeding cavity which was packed with gauze. The pathologist reported the mass to consist of inflammatory tissue solely; there was no localized collection of pus but numerous pus cells were distributed in the tissue. Subsequent to the operation she developed a fecal fistula connected with the sigmoid, this closed spontaneously and all trace of the tumor slowly disappeared so that she was perfectly well four months after operation.

CASE III.—*Tumor in the pelvis which had been diagnosed as sarcoma.* Miss M., *act.* forty-five. In September, 1909, she had an attack of peritonitis with vomiting and pain. A second attack developed in July, 1910, and in November of the same year a third attack. Two weeks subsequently she had a fourth attack and in January, 1911, a fifth attack during which she passed fetid pus per rectum. She had lost very greatly in weight and a fixed mass could be felt occupying the pelvis. This was tender on pressure. There was considerable difficulty in getting the bowels to move and at times complete obstruction threatened. Temperature was 97° F., pulse 106 and leucocyte count 6,900 white cells.

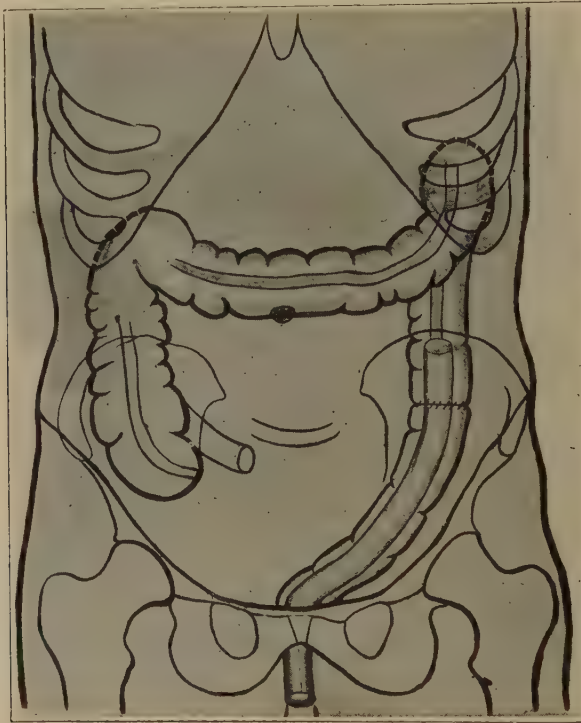


Fig. 3.—Repair of fecal fistula over a tube introduced into the sigmoid and rectum.

On February 10th, 1911, I opened the abdomen and found a mass firmly adherent to the uterus and rectum in Douglas' pouch, the appendix was embedded in this and a loop of small intestine was similarly tied down and acutely kinked (Fig. 5). The appendix was removed. The small intestine when freed was greatly constricted at the point of kinking and a perforation existed near by. The damaged portion of bowel was resected and an end to end anastomosis effected. While disturbing the mass a small abscess was opened and a culture from this showed the bacillus of tubercle.

The patient subsequently made a good recovery, has gained in flesh and is now enjoying good health.

CASE IV.—*Inflammatory mass developing during the puerperium and producing intestinal obstruction.* Mrs. T., *aet.* forty, a patient under the care of my colleague, Dr. F. N. G. Starr. She had been delivered of a child twelve weeks previously, followed by septic trouble which proved to be due to a streptococcus. This first appeared as a membranous exudate over the cervix with subsequent infiltration of the left broad ligament. The bowel was evidently pressed upon and symptoms of intestinal obstruction occurred.

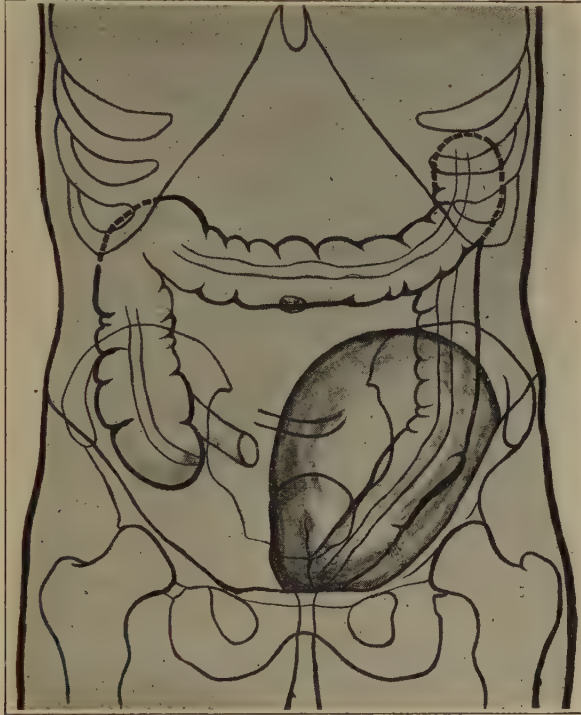


Fig. 4.—Inflammatory tumor attached to left iliac bone, causing obstruction and resembling sarcoma. Secondary to appendectomy.

Dr. Starr opened up the mass from which serous fluid exuded freely and her symptoms of obstruction subsided. Subsequently the right broad ligament was similarly invaded causing obstruction which was relieved by an operation similar to the first. A few weeks afterwards obstruction became complete and immediate interference was necessary to save her life. My colleague being absent from the city, I opened the abdomen in the middle line and inserted a Paul's tube in the distended loop of ileum which presented. The patient had a slow convalescence but eventually made a complete recovery. Dr. Starr successfully closed the fistula by a plastic operation.

These 4 cases illustrate a class of inflammatory tumors causing obstruction of the bowel concerning which very little has been published. Many monographs have been written on intestinal obstruction in which no reference is made to such tumor formations as a cause. Doubtless many tumors similar to the first three recorded here have been diagnosed in the past as neoplastic, and under such circumstances heroic attempts have been made to eradicate them followed by a high mortality. My object in recording these cases is to emphasize the fact that when such in-

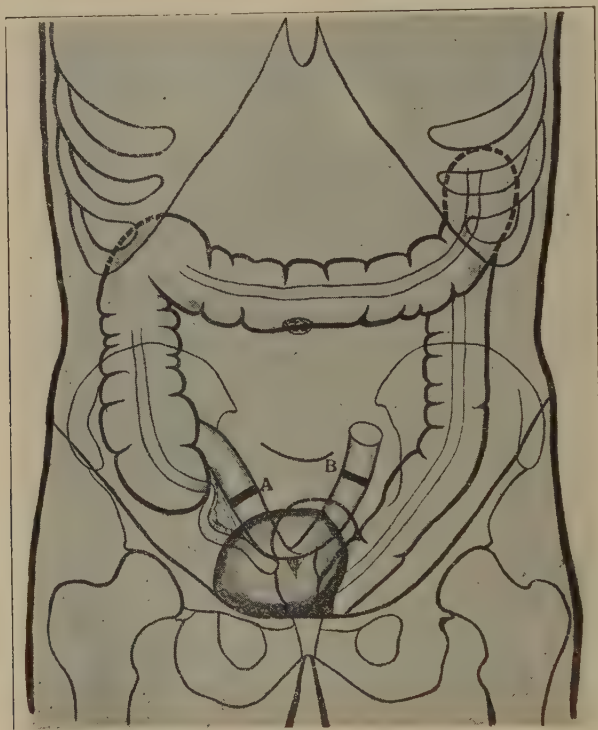


Fig. 5.—Inflammatory tumor which had been diagnosed as new growth, causing obstruction. A kink of the ileum exists and this with the appendix is imbedded in the mass. Resection of bowel and end to end anastomosis was performed at A. and B.

flammatory tumors exist the operative interference should be of the simplest variety, such as the creation of a fecal fistula or the resection of a damaged portion of bowel. The growth itself may be left to nature and will eventually disappear spontaneously, after which such plastic operation as may be necessary is performed to restore normal conditions.

While writing this paper I received a communication from my friend Dr. W. Gunn of Clinton, Ont., in which he records the following case:—

The patient was a young woman and an operation was performed for

the removal of an ovarian cyst and the appendix. The operation was not difficult and there were no adhesions to speak of. About four weeks afterwards symptoms of acute intestinal obstruction occurred necessitating immediate operation. A large mass simulating new growth was found involving and completely occluding the lower six or eight inches of the ascending colon. The wall of the bowel was half an inch thick or more and the infiltration around it was enormous. The bowel was separated as far as possible and a lateral anastomosis was made between the caecum and the ascending colon. There was no difficulty in accomplishing this as the colon was mobilized by previous dissection. The patient made a good recovery and has remained well since the operation which was performed about two years ago.

AN ESTIMATE OF FREUD'S THEORY OF THE NEUROSES
AND ITS VALUE TO THE NEUROLOGIST.*

By SIDNEY I. SCHWAB, M. D., of St. Louis.

I know of no more difficult task than to present to an audience of neurologists or at least to those whose presence here to-night indicates an interest more or less vital in neurology, a résumé of the Freudian psychology in such a way that its presentation shall not partake of the unbounded enthusiasm of the Freudians or the almost malignant criticism of their opponents. A purely objective attitude to the Freudian philosophy implies, according to most of them, an ignorance or misunderstanding of its literature and, on the other hand, suggests to its critics a fellow-feeling of detraction.

In responding to the invitation of your honored president to give to the Philadelphia Neurological Society some aspect of this much-discussed subject, I felt keenly the limitations within which I might be bold enough to attempt so grave a piece of exposition. Yet the opportunity seems so pregnant with possibilities that my own feeling of self-consciousness was soon lost sight of in the larger aspect of the importance of the subject and the widespread uncertainty regarding it.

My own qualifications for such a task are chiefly based on a year's study, and more or less close personal contact with Freud some years ago when his fame was limited to a small group of Vienna graduate-students known contemptuously as *die Anhänger von Freud*; on a careful study of the Freudian literature covering some fifteen years and now growing to huge proportions; and on many attempts of my own, some abortive and some more or less complete in carrying out Freud's ideas and methods into the actual treatment of neurological cases.

With these qualifications, however modest they might appear, I shall attempt to present a résumé of the Freudian philosophy under the following heads: (1) The idea and development of the theories of hysteria and the other neuroses; (2) the meaning, use, and technique of psycho-analysis; (3) the dream interpretation; (4) the association word-tests of Jung, and (5) a few words in regard to the utility of this form of treatment in the hands of an American neurologist with American patients. In passing I might say that the temperamental differences, to put it generally, between the American and Continental types seem to

*Read by invitation before the Philadelphia Neurological Society, February 24th, 1911.

me worth considering in trying to explain our many failures and our rather narrow limitation in respect to the selection of suitable cases.

In the *Neurologisches Centralblatt* for 1893 appeared a paper by Breuer and Freud, entitled "Ueber den Psychischen Mechanismus Hysterischen Phänomene," later elaborated in the well-known monograph, "Studien ueber Hysterie," which appeared in 1895. In these two papers were given the results of studies on hysterical cases carried out by means of light hypnosis and with the purpose of studying hysterical symptoms. At first there was no therapeutic intention back of these investigations, but as each hysterical symptom was followed to its point of origin it was found, much to the astonishment of the two investigators, that it promptly and mysteriously disappeared.

We found, they say, to our astonishment that the individual hysterical symptoms promptly disappeared and did not return, as soon as we succeeded in bringing to light the memory of the causes active in their production, and were able to deliver into consciousness the accompanying affect. This was the result if the patient could describe the occurrence in great detail and put into words the affective phenomena with which it was accompanied and bound up.

The notion that the memory of a psychical trauma acts psychically in the way a foreign body acts physically followed naturally, and the logical conclusion to be drawn from this idea was that its removal by some psychical process akin to its origin would result in the patient's relief.

A further development of this theory and the affect following karthartic analysis made plausible the dictum that the hysteric suffers for the most part from reminiscences.

The importance of a memory in this scheme of associative phenomena depends upon the force with which it reacts, that is whether the affective event is energetically reacted to or not. By reaction is meant the total group of voluntary and involuntary reflexes, physical or psychical, with which by experience the affective constituent is unloaded. If the reaction is sufficiently vigorous, a large part of the affect tends to disappear; if the reaction is suppressed then the affect remains bound up intimately with the memory. The reaction, therefore, has a karthartic affect only when it is adequate. In normal individuals there are at least two important mechanisms by which the adequate reaction may be supplanted. One is by means of a process of departure from the distinctive memory, or what Freud calls *abreagieren*, and the other is through chains of further association. In either instance reaction is, as it were, gradually and successively diminished. The karthartic method as originally used, therefore finds its therapeutic principle based upon the following facts: It increases the effectiveness of the insufficiently reacted idea to the extent that it allows the enclosed or shut-in affect to free itself through speech and permits it to come into contact with associative correction by its introduction into normal consciousness.

The method used in these early studies was, as it is remembered, a light degree of hypnosis. This was later given up and in its place free association was substituted, upon which, with certain unimportant modifications, the present method of psycho-analysis is based.

Up to this point in the development of the Freudian psychology little is said about, and not much emphasis placed, upon etiology. Some kind of trauma is assured even in the early studies; such psychical traumata were concerned with happenings which took place in the very early years of the patient's life, chiefly in infancy. It was with the assertion that the traumata were all of a sexual character, that the storm of protest arose from which discussion of the Freudian philosophy is at the present time clouded.

It is of less importance to dwell upon the separation which Freud has insisted upon of neurasthenia from states of anxiousness (*Angst Neurosen*), nor yet with the fine distinction, etiologically, between hysteria as a result of early sexual traumata and neurasthenia largely the result of masturbation, or whether *angst neurosen* are due to coitus interruptus or insufficient sexual reaction. All these to my mind are of less significance than the conception which Freud has in respect to their complete mechanism.

In "Drei Abhandlungen zu Sexual Theorie," appearing in 1905 is found a full statement to be modified as further investigation furnishes additional facts of Freud's view on the subject of sexuality. An excellent translation in English of this paper has been published by Brill.

There is perhaps no part of the Freudian theory which is more amazing or which is open to so much criticism as these now well-known papers. I scarcely know of anything in the literature of neurology more difficult to understand and more impossible to carry with one than the contents, deductions and conclusions of these papers. Yet they should be understood in order to appreciate the conception of the sexual etiology of the neuroses. I shall pass by as seemingly unimportant the Freudian notion of infantile perversions, fetishism, the sexual rôle played by the mucous membranes of the anus and mouth and his theory of bi-sexuality, as being somewhat foreign to our immediate needs, and come to the significant statement contained in the chapter on sexual aberrations. The claim is here made with emphasis that there is only one means through which a knowledge of the sexual problems of psychoneurotics can be obtained, and that is by means of psycho-analytic investigation. It is noteworthy that at the time of the publication of these papers, Freud included under the term psychoneuroses,—hysteria, obsessions, neurasthenia, and probably paranoia.

The psychoneuroses are sexual in origin in the sense that the sexual impulses furnish to them their activating power. The symptoms themselves thus become the sexual activities of the patient. The normal outlet of these activities has been cut off by a special process called repression. The thought-formations which are retained in the unconscious state strive

for expression,—that is for discharge in conformity with their affective value. They find such in hysteria through a process of conversion which expresses itself by means of somatic phenomena. These are transferred into hysterical symptoms, that is, they become what is later expressed in the clinical picture of hysteria.

The thought-formations are brought to light by the facts obtained in the course of psycho-analysis. These characteristics are regarded by Freud as open to study in any group of marked hysterics. One of these characteristics is an exaggeration of the resistance against the sexual impulse as shown by shame and loathing; the other characteristic is a pathologically developed sexual desire. In these contrasting features arises the conflict, the result of which is the transformation of the libidinous strivings into expressions of physical activity, which we have come to know as symptoms.

The chapter on infantile sexuality contains the strangest of all Freudian ideas, and to the inquiring mind they are the most doubtful elements of the whole system, with the possible exception of dream symbols. In its originality, perhaps, the notion that an infant of a year or two has an active sexual existence, with libido, choice of loved objects, and, to a certain degree, the psychical features of a more highly-developed individual, far transcends any other of the curiosities of the Freudian school. One's critical impulse is entirely subdued; either we must accept as true the infant sexuality because it is incapable of either proof or disproof or refuse it credence on the score of its utter absurdity. To do the latter would of course be fatal to the experimental side of the question, and to accept the former alternative creates a too ready acceptance of anything that is said and stamped with the Freudian approval.

It seems to me proper to take towards this question a purely expectant attitude,—that is to let the facts remain as such until our own experience in actual cases proves their right to acceptance or the reverse.

As far as can be set down in an incomplete and brief form, Freud advances the proposition that the new-born child brings with it into the world the germs of sexual feeling which continue to develop for some time and then succumb to a process of progressive suppression. The sexual life of a child manifests itself in the third or fourth year in some form accessible to observation. It is during this period of total or partial latency that there develop the psychic forces which later act as inhibitory factors on the sexual life. These psychic forces are loathing, shame, moral and esthetic ideas.

The means by which this is brought about is sublimation, which can be defined as the process of deviating sexual motive powers from one set of sexual aims or objects to new aims or objects. In the course of this process there is built up a mass of sexual potential activities which remain ineffective on account of the anatomical and physiological lack of development of the procreative organs. This remains the chief char-

acter of the period of sexual latency; if they did manifest themselves they would naturally be perverse as they would originate from erogenous zones, which later would be associated with feelings of loathing, shame and morality. Now when the age of puberty is reached, there is naturally an unconscious conflict between the breaking through of the impulses hitherto confined to the latent period and the early restrictions and repressions.

Among the manifestations of infantile sexuality are mentioned thumb-sucking, auto-erotism and others of like nature. The erogenous zones, anus, genital region, lips are the regions where the perverse sexual activity takes place and the mechanism consists in some form of a mechanical excitation. Given in an infant the presence of sexuality, the mechanical means of putting it into activity and zones to furnish the peripheral nerve stimulation, then the possibility of various kinds of sexual activity is furnished. The child becoming an object of sexual gratification to others, nurse, adults, and other children, its latent period of sexuality is transferred into an active one. By repetition, at the hands of the child itself in order to re-experience the pleasurable feelings associated with the act in the first place, a complete mechanism for the working out of the sexual traumata is formed. This is found as the chief etiological factor in an adult hysteria as discovered by psycho-analysis.

Jung, in what is perhaps the best exposition of the Freudian theory yet published, has with singular insight shown how Freud's hypotheses are but a natural development of Janet's work on mental dissociation. Out of the facts of psychical dissociation and unconscious psychical automatism is developed the Freudian formula of the problem of hysteria. A further essential step lies in Binswanger's dictum of the etiological significance of the affect. Both these premises, together with experiences derived from the theories of suggestion, form the groundwork of the idea, practically everywhere admitted to be true, that hysteria is a psychogenetic neurosis. Freud's work is largely directed to the study of the mechanism by which hysterical phenomena are produced. It aims at nothing less than to fill up the gap, in a most minute way, which lies between etiological beginnings and eventuating symptoms.

The original karthartic method, the mechanism of which is by means of light hypnosis, aimed to connect the individual symptoms with the traumatically affective foundation upon which they rested. As a result the affect was elevated into consciousness and reacted to by a series of normal emotional expressions. In this early method there cannot be much doubt that the patient followed the lead of the physician, and was suggestively influenced as the interrogations naturally became more direct and more pointedly limited to the progressively narrowing field in which were contained the definite events which were etiologically significant.

From 1904 on, Freud's method was changed entirely to one of free association in which the possibility of direct suggestive effect was entirely eliminated. The patient is no longer led by the physician, but is given the freest possible opportunity to tell everything that happens to be associated with any given train of thought. In effect, it is the patient who makes the analysis. The duty of the analyst is therefore to keep an account of the various experiences related by the patient, and from time to time to call to his attention the importance of this or that fact in the chain of reminiscences. Freud is enabled to hit upon the correct things to emphasize by virtue of his large experience gained by a large number of cases analyzed and by the reactions of the patient to the events which he relates.

It can easily be seen from this how very much more complicated the method has become, and how much more subtle the technique in this sense is. The aim of the analyst has thus come to be an effort to bring into the patient's consciousness all the false associative chains originating from a complex, and thereby to disentangle them so that the patient gradually comes to gain a deep insight into his own clinical picture and through this to arrive at an absolutely objective attitude towards his own complex. This is the educational feature which Jung and Prof. Putnam have placed particular emphasis upon; the former pointing out a certain resemblance between the Freudian psycho-analysis and the method by which Dubois is able to correct the false attitude of his patients to their symptoms.

It is evident that the method of itself is simple enough, but the appreciation of the minute reactions of the patient, in the course of the analysis, demands psychical insight of so subtle a kind as to be beyond the reach of any but a few. It is questionable to my own mind if anyone has mastered the technique in its far-reaching aspect outside of Freud himself. A comparison of the published accounts of psycho-analytic procedures in cases at the hands of others—and their number now is very large—with Freud's own, notably his "Bruchstueck Einem Hysterischen Fall" and his "Analyse der Phobie Eines Fuenf Jæhrigen Knaben," leads one to believe that only the master himself has a sufficient fund of knowledge and experience to guide him into the dark and intricate places where the sexual reminiscences are hidden from view.

For the lesser endowed, whether by lack of experience or by less acute psychological insight, a way has been opened through the method of word-association tests of Jung. By its use one is enabled at least to approach somewhat closer to the paths which can be profitably followed. Ernest Jones in this country has given in several places a clear exposition of this method, which briefly consists in taking, as starting points, associations accompanied chiefly by delayed association time-tests. These are followed by re-association until their final impingement upon emotional experiences, or rather I should say affective experiences tinged largely with the sexual atmosphere.

I cannot emphasize too greatly the aid which I myself have obtained through this procedure, and how the fog has been lifted from what would otherwise have been a darkened chaos of disconnected events often separated by such long periods of time that their relationship seemed utterly out of the question. How Freud stands upon this interpolation of his technique, I am unable to state. As far as I know he neither makes use of it nor mentions it except in one place and that somewhat vaguely, in touching upon the fact that Jung has proved the truth of some of his theories by approaching them in this way. I should like to conclude this part of my paper by quoting a résumé of Jung's on the Freud Hysteria Concept. First, there develops upon a constitutional anomaly certain precocious sexual activities of a more or less perverse nature. Secondly, these activities do not lead at first to hysterical symptoms in themselves. Thirdly, at the time of puberty (which psychologically is of an earlier date than the physical age of puberty) the phantasy is forced into channels tinged by infantile sexual activities. Fourthly, the phantasy, strengthened by means of the constitutional (affective) forces, leads to the formation of complexes which are not in harmony with the rest of the content of consciousness, and are therefore overlaid by the process of supplantation which is active through modesty and disgust. Fifthly, in this process of supplantation the transference of the libido to a loved individual is carried. Out of this the emotional conflict arises, which in its turn gives an opportunity for the outbreak of the true disease. Sixthly, the origin of the symptoms of hysteria are due therefore to the conflict of the libido against the process of supplantation. They reveal themselves, therefore, as nothing other than an abnormal sexual activity.

I am left with but little time to devote to the *Traumdeutung*, perhaps the most original of the whole Freudian psychology, and to which Freud himself has given the greatest emphasis. I am under the impression that to Freud this is his chief claim to scientific recognition. It seems easy enough to appreciate, in such a work as the "Bruchstueck," the part that dream interpretation plays in his analysis, but it is wellnigh a hopeless task to set down on a page or so, the gist of this curious and elusive expounding of dream phenomena. It is much more of a task to connect with the rest of the Freudian hypothesis the dream interpretation and to give to it its proper place in his method and technique.

The sources of information concerning the dream theory are the book called "Traumdeutung," now in its second edition, not yet translated; "Ueber den Traum," a more or less popular exposition found in one of the series published in "Grenzfragen des Nerven und Seelen Lebens" issued by Loewenfeld and Kurella; and scattered references to dream interpretation found throughout the whole Freudian literature.

Freud's insight into the dream phenomena is derived largely from the experiences obtained in the psycho-analysis of neurotics. Ideas of

anxiousness (*Angst Ideen*) and imperative ideas stand in a singular way unfriendly to the normal consciousness as dreams stand to the awakening consciousness. Their origin is just as unknown to consciousness as are dreams. There is then the same unknown territory between the origin of a dream and its manifestations as there is between the origin of an imperative idea and its final expression. The associative chain is to be followed out in one instance as in the other by a similar process of analysis.

By the procedure of association free from any suggestion, the dream events can be broadened out into a mass of psychical material.

It is readily apparent that in any dream there are two kinds of psychical stuff. One is the evident material of the dream experience, the facts as it were, of the dream narrative; this is the manifest dream content. The other is the associative end-results to which the events of the dream, by methods of analysis, lead. This is called the latent dream content. The phenomena underlying the evolution of latent to manifest dream content is called dream work (*Traum Arbeit*). The opposite of this which aims to unravel the associative chain from manifest to latent dream content is called dream analysis. In respect to the relation between latent and manifest dream content, dreams can be divided into three classes. First, there are the dreams which are sensible and immediately understandable, that is a presentation which encounters no sense of strangeness in our psychical life. Next, there are such dreams, which although they hang together, and are in a measure sensible, occasion a reaction and a feeling of strangeness in our psychical life. Such is the case if one should dream that some beloved one dies of the plague when there is no expectation or fear of such a thing, and we ask ourselves in great astonishment how could we have come to such an idea. Then there are the dreams which appear senseless and confused without meaning or connection. The majority of dreams belong to the third category.

In studying the simplest sort of dreams—namely, those of infants, a large number of which Freud has made use of, it can be seen that they have largely to do with the fulfilment of wishes, and that furthermore such wish fulfilments are immediate in origin, frequently of the day before or with desires that have been part of the preceding day's experiences. A further variation of such dreams is the condition of the wish fulfilment already accomplished. The dream partakes then of the sensations and experiences which can be associated with a state of completion in the light of such a wish or desire.

In the attempt to explain how the wish fulfilment can be connected with dreams that are unpleasant and undesirable, Freud gives what appears to be a somewhat far-fetched explanation; in fact, explanation that strains one's credulity to some extent. The transposition of what on the surface appears unpleasant to something which is the opposite

comes about by what can be described as an imaginative *tour de force*, or extreme ingenuity. The individual appears in the dream in the guise of someone else, and in this sense the wish motive, as it were, is fulfilled. Examples of this kind of thing are given in great abundance in the "Traumdeutung." Dreams belonging to the third category show by their analyses to be much richer in material than the dream content leads one to believe; therefore, dreams have the power of enormously condensing the material. By means of the power of condensation (*Verdichtungs Arbeit*), many of the curious ideas in a dream may be explained. The figures are made up of component parts of several individuals, animals of no recognizable types. The terrifying and unnatural beasts and figures are composite pictures which in the condensation process appear for the instant as one.

Every element of the dream content is by means of the dream thought over-determined, and owes its origin not to one element but to many.

These do not stand in approximation in the dream thought, but belong to the most widely-separated circles of the thought fabric. The dream elements in the true sense are representative in the dream content of all of those materials, no matter how distant they are from each other.

Of great importance in understanding confused dreams is the element of displacement (*Traum Verschiebung*) or the undervaluation of the psychical worth of a dream event. In analyzing a dream, therefore, it is essential to appreciate that the facts of a dream do not necessarily give a measurement of their psychic value, for upon analysis the seemingly unimportant events lead really and very directly to vital latent elements. It can be seen perhaps from such brief abstracts that Freud is attempting to use the rich and varied mass of psychic stuff found in dreams to broaden out his material for psycho-analysis in the neuroses. He finds much the same kind of mechanism at work in the one set as in the other. In truth, he says, that dream work (*Traum Arbeit*) is merely the first recognizable among a series of psychical processes upon which rests the origin of hysterical symptoms, anxiety, imperative and delusional ideas. Condensations and replacements are never failing characteristics of these other processes.

One of the most important activities in dream work is the process by which dream thoughts of an unpleasant or strange kind are prevented from entering consciousness. This process is termed by Freud *verdrangung* or supplantation. The formula is therefore advanced that the dream is the disguised fulfilment of a supposed or supplanted wish. This process is further elaborated in this way. It is assumed that in our psychical apparatus there are two thought forming organizations, the second of which seems to be the more active and powerful in that its products find an easy entrance into consciousness. The activities of the second organization partake of the unconscious and only reach consciousness over the second. At the borderland of both organizations at the place where their outposts meet, as it were, there is found a censor, the duties

of which are to shove out and hold back from consciousness everything that is unpleasant and strange and to admit into consciousness only that which is pleasant. That which is sent back by the censor is in a condition of *verdrangung* or supplantation. Under certain conditions of which sleep may be one, the relative strength of these two organizations changes, so that the supplanted ideas cannot be altogether held back. In sleep this comes about because the censor is, as it were, unmindful at his post, so that the supplanted ideas, formerly shoved back into the unconsciousness, succeed in reaching consciousness; not, however, in their original strength, nor yet altogether colorless, for the censor is still somewhat active, but in a state of lessened vigor and lessened definiteness; in other words, in a condition which Freud calls a compromise. The process then is *verdrangung*, neglect of the censor compromise effect.

Apart from the psychological interest which must always attach to attempts in explaining dream phenomena, our chief concern is to discover in the *Traumdeutung* a necessary connection both in its theoretical side and in the practical carrying out of the psycho-analytical procedure.

It is to be remembered that in Freud's book on "*Traumdeutung*" a large part is devoted to the relation of actual dreams and their analyses. A great deal of this is necessarily tedious and difficult to follow, and a large part must likewise be regarded as unconvincing. This is due perhaps to its extreme novelty and to the use of a terminology that has no place in our present psychological literature.

Two features, however, stand out with some emphasis. There is the discovery of a mass of psychological material derived from the dream analysis, which cannot fail to be of importance on account of the insight it furnishes into the intimate soul activity of the neurotic patient; and there is the connecting link between the origin of psychoneurotic symptom and the origin of a dream material, in both instances sexual in character.

The theory of the psychoneuroses asserts with absolute certainty that only sexually-originating wishes can arise in the infantile period. In the developmental period of childhood, these experience the process of supplantation, and later in pubescence are capable of revivification; thus is given the energy for the development of all symptomatic structures. In the early edition of "*Traumdeutung*," Freud leaves unanswered the question whether the dream theory rests upon some kind of originating sources in its casual relation as do the neuroses. In the second edition of "*Traumdeutung*" Freud answers this question as follows: "The more one is concerned with the solution of dreams the more one must admit that the majority of dreams have to do with sexual material which brings into active expression wishes of an erotic nature."

The difficulty in interpretation lies often in the seemingly abrupt ending to which our analysis leads. To all intents and purposes, the dream lies perfectly clear before us in respect to its narrative events, and becomes to most of us a fully-interpreted dream: this for Freud is the most

superficial explanation. To go beyond this it is necessary to make use of dream symbols and their curious and most unexpected meanings. To understand them, it is essential to acquire a mass of facts derived from folk-lore, mythology, historical and pre-historical traditions, which to most of us is apparently an impossible task. What is left can be largely stated in this way: If in any of the confused dreams our analysis does not lead us back to its sexual origin, then our analysis is necessarily incomplete and superficial and so we are forced to let the matter rest.

I am aware of the inadequacy of this presentation of *Traumdeutung*; but if I have succeeded in supplying some kind of connection between the facts discovered in the analysis of dreams and facts that appear as established in the symptoms of neuroses, I shall have succeeded in creating some kind of unity which at least gives the Freudism concept a sort of hanging together quality which, upon first sight, it does not possess.

The value of the Freudism philosophy to the neurologist, I suppose, depends largely on the personal experience of the one who happens to be trying the method out. As a therapeutic measure it has without doubt won for itself a place which cannot be denied. I know of nothing in my own experience which has seemed to me quite as valuable as the psycho-analysis of laying bare to the neurological eye, the fabric of a patient's intimate psychical life.

The effect upon the patient is less easy to determine. How far the educational effect will extend, and how nearly it will restore the victim of a neurosis to a normal being, are things that cannot be answered at the present time. By what standards are we to measure the curativeness of a method as intricate as this, and further by what standards are we to measure a patient in respect to his state of being cured. Neither Freud nor his students have concerned themselves with questions of this kind nor, perhaps, do they see the necessity of attempting to do so.

There remains then this fact, and it is a stubborn fact. Almost everyone who has used the Freudian methods, after careful preparation, has been so impressed by its main truths that he has continued its further use, and the larger his experience grows, the more evidence he finds of the correctness of the Freudian assertions in general and the less incongruous and strange do the majority of them appear. This has been about my own experience, in one I might add, to whom Freud's work has up to within a fairly recent time been of vital theoretical interest, but singularly impracticable as a therapeutic application.

Perhaps what is of value in the Freudian psychology is that indefinite part of it, which happens to be true, and this part is a large or small proportion of the whole depending upon the insight of him who happens to be the analyst. At any rate it seems fair toward such a vexatious question to take a kind of pragmatic attitude. Let us assume that such part of the Freudian scheme is true which happens to be of use, and proceed further in the assurance that its utility tends to increase with its further application.

MEDICAL AND SURGICAL PROGRESS.

EHRLICH'S "606."

A REVIEW OF THE LITERATURE SINCE JANUARY, 1911.

By WM. ENGELBACH, M. D., of the Editorial Staff.

1. Abelin: Directions in Regard to a Method for Injecting Salvarsan. (*Muench. Med. Wochenschr.*, No. 19, p. 1002, 1911.)
2. Alston: Curative Effect of Salvarsan in Framboesia. (*Brit. Med. Journ.*, p. 618, March 18th, 1911.)
3. Balfour: The Effect of Salvarsan on Treponema Pallidum. (*Brit. Med. Journ.*, p. 1174, May 20th, 1911.)
4. Bayley: The Intravenous Method of Treatment of Syphilis with Salvarsan ("606"), with a Convenient Apparatus for such Administration. (*Lancet*, p. 153, January 21st, 1911.)
5. Beisele: Directions in Regard to a New Method for Injecting Salvarsan. (*Muench. med. Wochenschr.*, No. 24, p. 1313, 1911.)
6. Bernard: Salvarsan ("606") and Mercury in the Treatment of Syphilis. (*Lancet*, p. 253, July 22nd, 1911.)
7. Blayney and Dempsey: Experiences with "606" in Syphilis. (Report to Royal Academy of Medicine in Ireland, May 26th, 1911.)
8. Czerny and Caan: Experiences with Salvarsan in Malignant Tumors. (*Muench. med. Wochenschr.*, No. 17, p. 881, April 25th, 1911.)
9. Desneux and Dujardin: Nerve Lesions after Treatment of Syphilis with Salvarsan. (*Deutsch. med. Wochenschr.*, No. 23, p. 1245, 1911.)
10. Evans: The Treatment of Syphilis by Salvarsan (dioxy-diamido-arseno-benzol). (*Brit. Med. Journ.*, p. 617, March 18th, 1911.)
11. Fleming and Colebrook: On the Use of Salvarsan in the Treatment of Syphilis. (*Lancet*, p. 1631, June 17th, 1911.)
12. French: Salvarsan ("606") and Mercury in the Treatment of Syphilis. (*Lancet*, p. 1691, June 24th, 1911.)
13. Gerber: The Effect of Salvarsan on Syphilis of the Upper Air-Passages, Scleroma, Plaut-Vincent's Angina, and Scorbutus. (*Arch. fuer Laryngol. u. Rhinol.*, Band 3, p. 266, 1911.)
14. Goldenberg and Kaliski: Salvarsan. (*Amer. Journ. Med. Sciences*, March and April, 1911.)
15. Hallopeau: Hectine and Salvarsan in the Treatment of Syphilis. (Académie de Médecine, July 11th, 1911.)
16. Jesionek: Salvarsan Milk. (*Muench. med. Wochenschr.*, No. 22, 1911.)

17. Marshall: Remarks on the Treatment of Syphilis with Dioxydiamo-arseno-benzol ("606"). (*Lancet*, p. 501, February 25th, 1911.)
18. Martius: Deaths Resulting after Injection of Salvarsan in Diseases of Heart and Blood-Vessels. (*Muench. med. Wochenschr.*, No. 20, p. 1067, 1911.)
19. Mayerhofer: On the Favorable Therapeutic Influence of Salvarsan in a Chronic Case of Chorea Minor in a Child. (*Wien. klin. Wochenschr.*, No. 27, p. 976, 1911.)
20. McIntosh and Fildes: "606" and Syphilis. (*Lancet*, p. 724, March 18th, 1911.)
21. Montesanto: The Influence of Salvarsan on the Bacillus Lepae. (*Muench. med. Wochenschr.*, No. 10, p. 511, March 7th, 1911.)
22. Mucha: Salvarsan Treatment of Syphilis. (*Wien. klin. Wochenschr.*, No. 27, p. 963, 1911.)
23. Neuhaus: Experiences with Salvarsan in Syphilis of the Central Nervous System. (*Muench. med. Wochenschr.*, No. 18, p. 955, 1911.)
24. Ploeger: Remarks on the Technique of the Intravenous Injection of Salvarsan. (*Muench. med. Wochenschr.*, No. 20, p. 1071, 1911.)
25. Rost: Salvarsan in Framboesia, Leprosy and Granuloma Tropicum. (*Muench. med. Wochenschr.*, No. 21, p. 1136, 1911.)
26. Stokar: Salvarsan Treatment by the General Practitioner. (*Muench. med. Wochenschr.*, No. 24, p. 1305, 1911.)
27. Stuelp: Experiences with Salvarsan in Syphilis of the Eye from Literature and Personal Observations. From the Eye-Clinic of Dr. Stuelp at Muehlheim. (*Klin. Monatschr. fuer Augenheilk.*, No. 49, p. 369, March, 1911.)
28. Taylor and Mackenna: Salvarsan in the Treatment of Syphilis. (*Lancet*, p. 1412, May 27th, 1911.)
29. Wechselmann: New Experiences with the Intravenous Injection of Salvarsan without Untoward Occurrences. (*Muench. med. Wochenschr.*, No. 28, p. 1510, 1911.)

A classification of the literature published on the subject of salvarsan since January 1st, 1911, impresses one with the fact that a review limited only to the important articles would be too extensive and contain too much of repetition for the space assigned to this department. For this reason, this review does not include the American literature upon the subject, or abstracts of those articles which have appeared in other departments of this JOURNAL, but contains the less accessible foreign literature which was deemed reliable and authoritative and which represented the most recent developments concerning salvarsan. The subject-matter has been arranged in groups dealing with the peculiar organo-chemical reactions, the newer technique, well-considered criticisms concerning its value, the general use of the drug, the effect of salvarsan upon general specific infections, its effect upon local specific lesions of special systems,—nervous and circulatory, and special sense organs as the eye, and its effect upon other diseases,—Vincent's angina, chorea, etc.

The many recurrences and relapses and untoward effects, both local and general, which have occurred in almost every investigator's experience after the use of salvarsan, have already disqualified the absolute specific and uninjurious actions of this drug, reports of which dominated the

earlier literature upon this subject. Notwithstanding these results, the accumulation of evidence which is presented by an analysis of all the literature to date, already proves that salvarsan is probably the one most potent remedy which can be directed towards retarding,—but not absolutely ending, the activity of the spirochæta infection. That one dose of this remedy will not cure human syphilis is probably now beyond question. That a salvarsan cure or salvarsan combined with other treatment, given with proper technique, under correct indications, seems to be the most adequate means of treating this disease is the consensus of opinion deduced from these investigations. This drug should be considered then more in the light of a valuable remedy which will act as an adjunct or a temporary substitute to the already well-known therapy of this disease.

Abelin presents a new method of testing the presence of salvarsan in fluids, especially in the urine. He obtained a characteristic color-reaction by applying the Ehrlich diazo-reagent. Five or six drops of diluted hydrochloric acid are added to seven or eight c. mm. of urine, the solution is cooled and three or four drops of a 0.5 per cent. solution of sodium nitrate added. If a few drops of this solution is added to five or six c. mm. of the colorless alkaline resorcin solution, a distinctly red color reaction is gotten. If this mixture stands for a time, a dark zone forms at the top. Urine free of salvarsan thus tested gives a yellowish color reaction. It is imperative that the solution be alkaline, as free acid checks the color reaction. Abelin found salvarsan present in urine as early as two hours after its injection.

Beisele takes exception to Abelin's statement that a specific diazo-reaction for salvarsan can be found in the urine of a patient who has been submitted to an injection of "606." Abelin describes the color of the reaction as reddish-brown. Beisele holds that the salvarsan undergoes transformation in the body, and that Abelin must have been mistaken in his analysis. He furthermore states that the color for the salvarsan reaction should be cherry-red; a brown color can be obtained with the Ehrlich reagent in all urine. The dark zone which forms after the solution stands for some time is due to oxidation, which takes place in most phenols in alkaline solution.

In the course of 4,500 injections of salvarsan—2,500 subcutaneously and 2,000 intravenously—Wechselmann denies encountering any toxic effects. He explains the instances where such mishaps have been met as due to faulty technique, and emphasizes his statement by the following instance: A preparation of the drug was returned to Ehrlich by a Berlin apothecary to be tested, since it had occasioned several fatalities. The drug was tested on animals and found to be ideal. Thereupon Ehrlich requested Wechselmann to use it on one of his patients. It was employed and absolutely no unpleasant reaction met. Wechselmann feels that many fatalities are due to careless asepsis and recommends careful sterilization of the distilled water. Of course, some patients are super-sensitive, and more care is required. Patients with syphilitic aortitis and other cardiac complications must be closely watched. Though Wechselmann has treated many patients having cardiac affections, he has not had a fatality.

An apparatus which Ploeger has invented for intravenous injections has been used by him with great success in over 200 cases. He claims for it that it combines the merits of the syringe- and funnel-methods and that in it a simple needle may be used which is steadily guided during its introduction and firmly held during the entire infusion. Oozing blood,

which warns of an incorrect position of the needle, nevertheless does not blur the operating field. The salt or salvarsan solution is always directly behind the needle, and its warmth and solubility can be easily controlled. No air or splinters of glass can penetrate into the wound. In contrast to other instruments, Ploeger claims that his may be used without an assistant by those little experienced in intravenous technique, even in difficult cases requiring several punctures.

Taylor and MacKenna recommend the intravenous method as far more satisfactory, in comparison to the intramuscular, in "striking a sudden and powerful blow at the micro-organism of the disease." This method is also for the most part painless. The solution is carried by the blood-stream throughout the body, and the lethal effect upon the spirochætæ is immediate. The vein chosen for the injection should be either the median cephalic or the median basilic. The greatest care must be taken to ascertain that the lumen of the vein has been punctured. The sense of touch, the appearance of the blood at the little glass window in the tube, the absence of swelling over the vein when the container is elevated and the normal saline solution is introduced, are facts which attest to a correct puncture. During the injection, the patient often complains of a sensation of pins and needles all over the body or in the arm operated, or he may have a feeling of fullness in the head. These symptoms may be relieved by lessening the rate of flow. Nausea, vomiting or diarrhea, rigor and rise of temperature are also, at times, concomitant results of the injection. The more acute the infection, the more marked the reaction; for then immediate destruction of the spirochætæ takes place, and the liberation of the endotoxins which flood the system gives rise to these systemic disturbances. All unpleasant results are, however, soon relieved, and after the sixth day, no trace of arsenic can be found in the urine. Nevertheless, recovery keeps on, due perhaps to the antibodies produced. Lesions of the mucosa, especially of the upper air-tract, are most amenable to treatment, the relief often being miraculously quick. Chancres disappear in eight to fourteen days, and a papular rash clears up in about ten days. In parasymphilitic conditions, due to active inflammatory processes and not to actual sclerotic degeneration, "606" will also prove effective. It cannot restore nerve tissues which have undergone sclerotic changes. The authors point out that the relapses which have occurred—in about 25 per cent. of the cases—have been due in part to the small doses which were at first administered, and the fatalities—often in infants—have resulted from faulty technique. All the cases treated by them have responded remarkably well, without disasters or accidents. They advise, in conclusion, that salvarsan should be intravenously administered to every fresh case of syphilis and a second dose given if the Wassermann reaction is still positive after a week. It may be well to follow up stubborn cases by administering later mercury or the iodides, so that any arsenic-resisting spirochætæ which may form may be destroyed.

Blayne and Dempsey reported their experiences with "606" to the Royal Academy of Medicine in Ireland, and the steps that led to its use. The intravenous method was found to be the preferable one and a cure was effected in nine of ten cases treated. The unsuccessfully treated case was one of tertiary infiltration of the larynx. After an interval of five or six days, a second injection is strongly recommended in all cases.

Fleming and Colebrook's experiences with salvarsan cover a period of nine months. They abandoned the intramuscular method upon the recom-

mentation of Ehrlich, and found the intravenous one less painful, quicker, and resulting in fewer relapses. The apparatus used by them is similar to one described by Schreiber about a year ago. It consists of a syringe connected by a three or four-way tap to a needle and to the receptacles for the two solutions. Fleming and Colebrook have made several modifications and additions to this instrument to meet the needs of the operations. The vein best suited for the operation is one of those at the bend of the elbow. To avoid lacerating the walls of the vein, they pass a piece of strapping around the arm and the butt of the needle. The patient should be kept in bed for about thirty-six hours, or at least for twenty-four hours after the temperature becomes normal. Often following the intravenous injection there is a throbbing and feeling of fullness in the head, chills, rise in temperature, etc. But these symptoms subside in twenty-four hours. In only one case which had been intramuscularly injected was there persistent high fever for a week. Many of the cases injected by them had been under mercurial treatment without improvement. One case which had been submitted to an injection of 0.7 gm., showed rapid improvement in the original scalp ulcer, but a few days later a node appeared on the forehead which moved to various portions of the body. After a second intramuscular dose, the lesions still persisted, but a third intravenous injection effected a complete cure. In a case of ulceration of the nasal septum, the first injection (0.5 gm.) even aggravated the process. However, after a second intravenous injection the ulceration was arrested. The effect on the Wassermann reaction was variable and Fleming and Colebrook refrain from arriving at a conclusion as to their relation.

Bayley has found the intravenous method the preferable one for making salvarsan injections, and has devised an instrument which he claims facilitates the process, especially in so far that it prevents the needle from lacerating the vein while the operator manipulates the taps and plunger. His apparatus consists of a container surrounded by a hot-water jacket, a rubber tube about four feet long connecting the container and needle-holder, and a stout needle, one and a quarter inches long. Three inches from the needle-holder a piece of glass tubing is inserted to act as a window, by means of which the oozing blood may be seen, and which determines whether the needle is inserted in the vein. The flow is regulated by altering the height of the container and by a clip applied to the rubber tube about a foot from the needle-holder. The salvarsan must be injected slowly. It is wise to pour about 100 c.c. of normal saline solution into the irrigator just before the salvarsan has run out, so that the needle may be washed free of "606" before withdrawing; for if any of the solution escapes along the needle track, some local irritation may arise. If the patient be given a thorough physic the night before the injection and little food or drink hours before the operation, no alarming symptoms will become manifest. The temperature generally rises a few hours after the infusion, but usually becomes normal within twenty-four hours. The arsenic is almost entirely eliminated within a week, so that a second dose may be given within a fortnight. The patient should be kept in bed for twenty-four hours after the temperature becomes normal.

Balfour has examined by the dark-field method a preparation of serous fluid obtained from a patient four hours after the injection of "606," by scraping the surface of a buccal mucous tubercle which had previously shown the presence of *treponema pallidum*. At first only motile, highly refractile granules were found. Later, however, *treponema pallidum* became apparent, actively shedding granules. It seems that this granule-

shedding process of organisms, doubtlessly resistant, is an act on the part of the spirochætæ to protect themselves from total extinction. These granule-bodies are probably similar to spores. This observation has much bearing on the course of treatment. Several experimenters have found that an immediate second dose of salvarsan has a very good influence upon arresting the course of the disease. Balfour concludes that this second dose kills the resisting granules which have been shed, and prevents a recurrence due to storing up of the infection.

Jesionek followed the plan of Teage and Duhot in treating congenitally-syphilitic infants by injecting the mother with salvarsan, but does not report the satisfactory results recorded by them. Contrary to the views of these men, he found arsenic present in the milk of women in whom this injection had been made. In both his cases, on the day following the injection of the mother, eruptions developed in the infant. These eruptions were apparently neither toxic, nor an arsenic eczema, nor a Herxheimer reaction. Were it not known that extensive virus is present in a congenitally-syphilitic infant, one might have supposed that the reaction resulted from a flooding of the virus. Jesionek concludes that through the milk of injected syphilitic mothers, there passes into the organism of the child an arsenic combination which can produce, qualitatively or quantitatively, toxic curative changes in the new-born: antibodies or endotoxins. These elements arouse the already present spirochætæ to, or capacitate them for, a pathological activity.

In one case he fed a syphilitic child of five years upon milk from a goat into which salvarsan had been injected, and obtained such good results that he feels warranted in recommending this method. An ideal way would be to inject an uninfected wet-nurse, but since this is rarely possible the child should be fed on milk from a cow or goat into which "606" has been previously injected. He points out that the milk of a syphilitic woman cannot be as wholesome, even though it contains antibodies, as salvarsanized milk free from these toxic syphilitic elements. He urges the infected woman to refrain from nursing her child at least during the first few days following injection, as long as there is any suspicion of endotoxins in her organism.

Stokar has found the subcutaneous and intramuscular methods of injection far less satisfactory than the intravenous, and recommends the latter. He advised those unfamiliar with the technique of intravenous injections to practise vein-tapping as is done for the Wassermann test. Skill can only be acquired by experience. Because of the initial difficulties Stokar advises beginners to expose the vein—a simple and almost painless process. Otherwise, especially in fat people whose veins are well embedded, various difficulties are met,—the vein is not at all punctured, or it is punctured through, etc. If the infusion is quite uncomplicated, the patient has little pain, nor are there any local reactions. Local thromboses can be prevented by avoiding getting any salvarsan around the vein. Stokar always makes a trial-injection of 0.1 grm. salvarsan in all patients showing symptoms of cardiovascular affection or affections of the nervous system. If this is well tolerated, he makes a second injection after four or five days. He has made over 700 intravenous injections; some of the patients beingluetics with serious heart and nervous diseases, and in no case has he had serious complications. The duration of the treatment should be intermittent for three or four years. Neisser advises that it be continued until all syphilitic symptoms disappear permanently and a permanent Wassermann reaction is obtained. Just what

the prognostic and therapeutic values of the Wassermann reaction may be, he is not prepared to say. Salvarsan has not simplified the treatment of syphilis. On the contrary, it has complicated it. But it has introduced a far more effective weapon for fighting it, and one by which its spread may be arrested in the initial stages.

In order to study the effect of salvarsan upon cardiovascular disease, Martius has analyzed all the cases on record, including those occurring in the Senckenberg Pathological Institute, and those about which Ehrlich has been personally informed. He reviews all fatalities: three of which occurred in his own practice, seven obtained from the literature, and eight hitherto unpublished cases. If the heart is sound, Martius feels that salvarsan may be safely administered, even intravenously, provided the dose is small (0.3 gm.), greatly diluted, and given slowly. However, great care must be taken that an acid reaction is not obtained. In only seven of all the known fatalities, resulting from the use of the drug, is there any question of the injurious effect of salvarsan upon the heart. In five of these seven fatalities, post-mortem revealed the triad: Syphilitic aortitis, coronary sclerosis, and myocarditis complicating myodegeneration of the heart. One case merely revealed hypoplasia of the heart and aorta, and in another case, in which the patient died in coma, extensive changes in other organs were found which easily explained the fatal termination apart from the effect of the drug. In four of these seven cases, no objective changes in the heart or vessels had been clinically apparent, and in only one was there a subjective symptom. Martius concludes that the triad: syphilitic aortitis, coronary sclerosis, and myocarditis are a positive, definite contraindication against the use of salvarsan. However, it is very difficult to arrive at conclusions, as is shown by the instances where death occurred just before the administration of the dose. Had the patients lived a little longer, salvarsan would have been given and then held responsible for the fatality. In cases of angina pectoris, where the heart and its muscles are intact, numerous instances prove the absolutely favorable effect of the drug.

Marshall decries the enthusiasm with which the medical world has and is responding to salvarsan. He feels that "606" can in no manner replace mercury or the iodides; that it is in fact a rather useless addition. Before any drug can be regarded as a substitute for the iodides or mercury, it must be proved capable of (1) aborting the disease; (2) preventing tertiary or parasyphilitic manifestations; (3) healing the lesions more quickly, constantly and permanently; and (4) causing fewer dangerous toxic effects. The first of these requirements cannot be proved for it or any drug, owing to the long latent periods that may elapse between the early and late manifestations of the infection. As to the second point, Marshall admits that the drug is too new to draw conclusions, but that mercury has been found to have this influence. He explains the fact that scientists heralded the results of salvarsan therapy as "marvelous," "miraculous," etc., as due to lack of "level-headedness." They forgot that mercury has the same rapid effect. Then, too, their enthusiasm was aroused before the relapses occurred. Recently, however, these recurrences have been frequent after the average dose (0.6 gm.). Marshall denies that "606" has a value as a substitute drug; for the cases where mercury or the iodides fail, are instances in which the doses of these drugs have not been administered properly. If the individual needs are studied, this medication suffices. Lastly, the intravenous method is extremely dangerous and several fatalities may be traced to this cause. The

deaths that have resulted from mercurial treatment have been due, not to the drug, but to the method of administration. After weighing the pros and cons, Marshall concludes that "606" in its present form cannot supplant the older therapy, and that it would have been better for the profession and for the public if its use had been greater restricted.

McIntosh and Fildes take issue with Marshall for his statement that the results with salvarsan therapy have been unsatisfactory and that the drug cannot in any wise be considered as a substitute for the iodides or mercury. In the course of their eight months' experience with "606" in the London Hospital, where all but one of the patients submitted to the injection have been under continuous observation, quite the contrary has been found true. With the exception of one case of interstitial keratitis and three in which secondary pathological complications were found, good results were obtained. Relapses have occurred, but they have resulted from insufficient doses. Marshall errs in supposing that 0.6 grm. is an average dose. Ehrlich himself recommends increasing the amount until 1.0 to 1.4 grm. have been given. Of course, this quantity is administered in fractional parts at intervals, covering several days. Unless the patient receives this amount, relapse may occur. The fatalities reported in cases of general paralysis, organic heart disease, or vascular degeneration, have been due not so much to the drug itself, as to an improper use of it. The blindness which occurs has no direct connection with the medication. Such cases are pure relapses, syphilitic iritis or retinitis, and do not occur oftener than in mercury treatment. McIntosh and Fildes feel that "606" is far superior to mercury in the symptomatic treatment of syphilis and in arresting the development of the infection.

French belongs to those who feel that the support which salvarsan therapy is obtaining in the medical world is somewhat misplaced. He admits that it is of some value in the later stages of syphilis, but that in early syphilis it is not an actual curative agent like mercury. He quotes Kalberstaedter and others as saying that though salvarsan is an excellent remedy, the extravagant statements regarding its curative powers are unjustifiable, since relapses occur so frequently. French believes mercury should only be supplanted by "606" in those cases of advanced syphilis where mercury is positively contraindicated. In other cases, mercurial medication, if properly administered, will be found to suffice. The usual mistake lies in not giving a sufficiently intensive course of mercury in a suitable form in the early primary stage or in administering it too profusely in the later anemic, debilitated, or malarial stages. Most of the cures recorded as due to "606," French feels, would have been more rapidly effected by the use of mercury or potassium iodide, which would have been a far more potent factor in preventing relapses and tertiary manifestations. The number of casualties due to salvarsan—fourteen deaths in infants and seventeen in adults—seems to him also to warn of the danger of the drug. Some authors advise a combined use of "606" and mercury, but French objects that if it has value it must effect results alone. The influence of this drug upon the Wassermann reaction, too, has been so variable thus far, that this reaction has been of little use in directing the treatment. French concludes that salvarsan is far inferior to mercury and will never supplant it. In most cases of syphilis, it should not be used in place of mercury within the first six months from the date of contagion. In the course of his discussion, French severely criticizes Ehrlich's manner of "admixing commercialism with scientific medical research," and of putting the drug on the market at the forbidding price of 10 s. for a dose of 0.6 grm.

Hallopeau states that the employment of salvarsan ought to be reserved for those periods in syphilis when the disease becomes general. Hectine, employed locally by injections, is preferred by him because it is effective in the primary lesion. Its abortive effect on the disease itself is accomplished if a sufficient number of injections is made, and these, moreover, should be made as near as possible to the initial induration. If this is done, it is said that there will be a great diminution in the frequency of this infection.

Thus far Mucha has used the salvarsan therapy in 528 cases, in some of whom the dose was repeated; in one case, four times. Of his 528 cases, 150 (28 per cent.) did not again return for treatment. 102 of this total were in the primary stage (86 men and 16 women). 322, in the secondary stage (180 men and 142 women); and in the tertiary stage, there were 56 (33 men and 23 women). Most of the later injections were made intravenously, since personal and other experience pointed to this method. After the subcutaneous injection, a necrosis often arises which persists for several months, and when the intramuscular method is employed necrosis arises in the tissues which come into direct contact with the drug, and traces of arsenic persist for months in the urine. For the injection, Mucha uses a modification of the Weintraud apparatus. The average dose for healthy adults is 0.4 gm. Whether permanent cures resulted in any of the cases, it is now too early to judge; relapses have occurred almost as frequently as under mercurial medication. In only one case were there any serious complications following the intravenous method. In this one case, that of a woman whose physical examination showed nothing abnormal, the patient suddenly became cyanosed and respiration became difficult. These symptoms were much relieved as soon as the injection ceased. Local disturbances arose in three instances where some of the fluid came in contact with the tissues around the vein. In two patients suffering from syphilis maligna, thromboses occurred, though the injection area showed no clinical changes. All his experiences prove that the intravenous method is far superior to the others and that it is far more pleasant for the patient. By this method, too, arsenic is absorbed more quickly.

Evans records his experiences in 44 cases in which the Ehrlich-Hata remedy was applied. These cases include simple chancre, chancres plus early secondary manifestations, secondary lesions, and eleven tertiary lesions. Thirty-four of these patients were submitted to the intramuscular method, while the others were intravenously injected. The results were uniformly good. The primary lesions disappeared in all the cases before the fourteenth day, usually earlier; secondary lesions also improved rapidly; and the tertiary cases, gummatous ulcerations of the skin, lesions of the buccal mucosa, etc., healed satisfactorily. In only one case—perforation of the hard palate with necrosis extending to the nasal septum—was the result less promising. The necrosis persisted and a second injection was made. In many of the cases treated, the iodides and mercury had been ineffectively employed. Evans has found that the intravenous method produces the more rapid cure in the primary and secondary stages, while in the tertiary stage, the results from the intramuscular are as prompt as from the intravenous. For men he used 0.4 gm., and 0.3 gm. for women. Though the condition of the patient immediately following the injection was often serious, all these symptoms cleared up within twenty-four hours.

Bernard recounts the experiences with "606" in the Liverpool Royal

Infirmery where 40 cases were treated within the last five months. The cases present the three stages, some being twelve-year-old infections. The rapidity with which mucous lesions yielded was "a revelation," a satisfactory result being obtained within a week. At first the intramuscular method was used, but later the intravenous was found to be more satisfactory. The median basilic was found to be the most convenient vein for the injection. In a neurotic patient showing atoxic symptoms, who had been under mercurial treatment without much success, an injection was made. Within ten days, much improvement was noted, and his gait became steadier. In none of the cases was there unpleasant reaction for any length of time.

Goldenberg and Kaliski used "606" on forty-eight patients. They found that manifest symptoms yielded within a week or two, lymphadenitis was slowly and only partially relieved, macular and pustular secondary cutaneous syphilides were more quickly influenced than papular eruptions. Wonderfully rapid results were obtained in lesions of the mucous membrane and moist condylomata. Circinate squamous syphilides reacted promptly, while gummata responded slower. Ulcers, periostitis and iritis cleared up in two to four weeks, while the effect upon cerebrospinal syphilis was immediate. In all but one case, the intramuscular method was used (0.45 to 0.6 gm. for women and 0.5 to 0.7 gm. for men). In some instances, the injection was repeated. Five relapses occurred. The authors conclude that unless there are positive contraindications, salvarsan should be administered in cases of syphilis, especially where there is malignancy—intolerance of mercury or serious gummata.

Neuhaus administered salvarsan, usually intramuscularly, in 17 cases of syphilitic and parasyphilitic affections of the nervous system which came under his observation. The cases were thus distributed: Tertiary cerebrospinal lues 7; subacute luetic (?); poliomyelitis 1; tabes 5; paralysis 2; hepar lobatum 1; and luetic (?) cirrhosis of the liver 1. He encountered no prolonged unfavorable results, though the immediate effect was often a rise in temperature and more or less severe pains at the point of injection. The latter were relieved through morphine and hot baths. Apropos of a fatality after the administration of salvarsan, for which a pyelonephritic condition was alone responsible, Neuhaus points out the difficulty of definitely determining that a death resulted from the use of the drug. He cites the following case: A woman was admitted to the hospital in an unconscious state, with exophthalmos and choked disc. Syphilis was surmised and a Wassermann test made, but before the results were determined, the patient died. The reaction was positive. The cause of the trouble, however, proved to be a tumor of the hypophysis. Had the results of the test become known before the death of the woman, salvarsan would have been administered and the fatal termination attributed to it. Neuhaus also points out that this case shows that a positive Wassermann reaction is not in itself a definite indication for specific treatment. During the course of his review he cites instances in which the Wassermann reaction remained unchanged even after the patient was dismissed from treatment, and states that salvarsan has little effect upon the test, and that it cannot be used as a guide in the treatment. In regard to repetition of the doses, the author states that his most successful results were obtained by injections at intervals of about four weeks. In one case, five injections of 0.3 to 0.5 gm. doses were made into the gluteal muscles and in the back, at intervals of about a month. Just how often the drug should be given, the future alone can determine.

It must be noted that salvarsan has both an immediate and delayed effect. Disturbances in speech due to apoplexy, pains, etc. are relieved after a few days; while the use of paralyzed portions of the body and the pupillary reactions are only restored three or four weeks after the administration of the dose.

Desneux and Dujardin report their experiences of neuro-recurrences, after the use of salvarsan, encountered in only six of a total of 350 cases treated. They feel that the reaction is not purely toxic. It often develops three or four months after the injection, and is very likely of a syphilitic nature. The severe headaches which appeared in all the cases, and the fact that the nerves affected were those lying nearest to the base of the brain, lead them to suspect a localized syphilitic meningitis. They call attention to the two phases in the treatment of syphilis. After an injection of less than 1 gm. the external symptoms disappear; but before the Wassermann reaction is permanently influenced, 2 gm. or more must be given. This amount is not often injected, for the reason that the fear of over-doses still exists, and also because the patient quits treatment as soon as the external signs are relieved. An insufficient dose does not arrest the development of the spirochætæ, but on the contrary seems to have a peculiar effect in shaping the direction.

Stuelp gives a splendid synopsis of literature, comprising one hundred and twenty articles, out of about two hundred and fifty original contributions, and about as many addresses and discussions on experiences in regard to the action of the Ehrlich-Hata "606" obtained from about 40,000 injections, with regard to the following points:—

1. What has the remedy so far achieved in syphilitic eye-diseases, and which indications concern the ophthalmologist?
2. For which accidental effects must we eventually be prepared?
3. Which contraindications have been ascertained so far?
4. Which method of application is the most suitable for the given case?

Up to February, 1911, Stuelp collected from literature 470 eye-cases which are arranged in anatomical order, followed by the brief clinical histories of 4 eye-cases and one of (luetic) albuminuria of his own. This showed no result. In a case of relapsing blepharitis and scrofulous (or luetic?) keratitis in a girl, affected with hereditary lues, the result was fair. In a case of optic neuritis and chorioretinitis of the macular region, there was at first improvement but afterwards a relapse set in. A woman, aged fifty, infected twenty-five years previously, was blind in right eye from an old neuro-retinochorioiditis, and had now the same recent affection of the left eye with V.=6/24, which, although treated with mercury and iodide, relapsed several times with iridocyclitic symptoms, headache, asomnia, slight paralysis of facial nerve, and forebodings of general paresis. Salvarsan effected, after a week, prompt general success with V.=I. The fifth case, a man aged twenty-eight, had a most severe parenchymatous keratitis, cornea white as porcelain, with slight cyclitic injection, V. reduced to perception of light. Two weeks after an injection of salvarsan, the cornea showed a decided clearing and the patient counted fingers nearby. The results of a single injection of salvarsan in the above mentioned 470 eye-cases were:—

	Prompt Result. Favorable Influence.	No Results Respectively, Relapses.
(a) In Syphilitic Affections of the Eyelids.	100 per cent.	—
(b) In Syphilitic Affections of the Conjunctiva.	63 per cent.	37
(c) In Syphilitic Affections of the Cornea (parenchy- matous keratitis).	28 per cent.	72
(d) In Syphilitic Affections of the Sclera.	80 per cent.	20
(e) In Syphilitic Affections of the Uveal Tract.	63 per cent.	37
(f) In Syphilitic Affections of the Retina and Optic Nerve (atrophy of optic nerve.	58 per cent.	42
(g) In Syphilitic Affections of the Ocular Muscles (tabes and paresis).	26 per cent.	74
(h) In Syphilitic Affections of the Orbita and Fifth nerve.	100 per cent.	—
Therefore inluetie affections of the eye, on the whole, about.	65 per cent.	35
If we compare with these Plaut's statistics on general syphilitic symptoms about.	77 per cent.	23

When we consider, on the one hand, that this collection contains a series of ocular affections (parenchymatous keratitis, ocular palsies in tabes, etc.), which are scarcely or not at all influenced by the former antisyphilitic remedies, and, on the other, that the publications were not always given with oculistic exactness and that the time of observation of eventual relapses is too short, we are forced to the conclusion, that theluetie eye-diseases react less promptly to salvarsan than the other syphilitic manifestations.

No case of blindness has been observed after salvarsan, but the following ocular and aural affections, most peculiar to the tertiary stage of lues, have been noted: In 15 cases, iritis; in 3, chorioiditis; in 15, optic neuritis; in 8, ocular palsies; and in 9, ear affections, viz., labyrinthine and vestibular phenomena, and acoustic neuritis. The majority of authors regard, with Ehrlich, these symptoms as relapses of lues "in alio loco," and emphasize that the nerves pass through narrow canals of the bone, which are lined with tough connective-tissue, and which, as places of predilection for nests of spirochætæ, escape the therapeutic impact. Others explain these apparent relapses as the action of endotoxins or as Herxheimer's reaction, a consequence of mechanical pressure on the nerve by transient swelling of the periosteum in the osseous canals. Others still attribute them to a combination ofluetie manifestations and the influence of arsenobenzol, especially through decomposition. Hence Stuelp concludes that salvarsan ought to be used in ophthalmology only: (1) If a speedy action is desired, as in primary ocular affections, or in secondary or tertiary symptoms, if a rapid impairment of function is dreaded; (2) in cases which do not tolerate, or respond to, mercury or iodine. Otherwise, an attempt with our well-proved antisyphilitic treatment ought to be made.

The most rigorous sepsis with salvarsan is indicated in ocular symptoms of tabes and paresis. This applies especially to the pupillary symptoms, on account of the difficulties of exact examination of the pupillary reaction. In tabes and paresis, salvarsan is indicated only if a positive Wassermann reaction and irreparable degenerations indicate the existence of activeluetie products, and after the patient and their relatives are made acquainted with the eventual deterioration of the condition and accidental results. These are local from infiltration, or ocular, such as pericorneal injection, cyclitic irritation, scintillating scotomata, transient amaurosis, glaucomatous increase of tension, and general fever, vomiting, diarrhea,

polyuria, tenesmus in rectum and bladder, albuminuria, hemorrhagic nephritis, diabetes, icterus, exanthemas, herpes zoster, fluctuations of blood-pressure, irregularities of pulse and action of the heart, and nervous disturbances of which the patients must be informed beforehand.

The contraindications are: (1) Non-luetic diseases of the optic nerve and retina; (2) neuroses and organic diseases of the heart and blood-vessels; (3) severe diseases of the lungs, excepting tuberculosis if there is no hemoptysis; (4) severe non-luetic nephritis and diabetes; (5) severe visceral lues, ulcers of the stomach; (6) advanced degeneration of the nervous system and alcoholism; (7) severe congenital lues of the newborn; (8) febrile diseases of various kinds; (9) menstruation; (10) senile degeneration, non-luetic marasmus and cachexia. The advantages of salvarsan, compared with mercury and iodide, are: (1) If it is effectual, it generally acts more promptly, so that one injection of salvarsan is equivalent to one week's energetic mercurial treatment; (2) it shortens the treatment in the hospital and decreases the spreading of syphilis; (3) in contrast with mercury it can be applied to the numerous tuberculous and slightly nephritic luetics. Finally the author makes some practical remarks on the best method of application which proved useful to him.

Schnaudigel reports the clinical histories of 21 cases which he injected with neutral emulsions of arsenobenzol into the gluteal region, with one exception (between the shoulder-blades). The results were very good in 4 cases of very severe hereditary parenchymatous keratitis. As frequently experienced with mercurial inunctions, the infiltration of the cornea of the second eye increased while that of the first affected cornea was subsiding. An unusually large papule of the iris disappeared six days after injection of 0.5 grm. of arsenobenzol. A luetic tarsitis which had existed for months also healed in a few days. Several cases of optic neuritis, papillitis, and papilloretinitis, healed also in a relatively short time; one of incipient papillitis was arrested. A palsy of the superior oblique in a case of spinal lues with considerable ataxia recovered in about six weeks. The general condition of a man affected with tabes, reflex immobility of the pupils and mydriasis, showed remarkable improvement three weeks after the injection of 0.6 grm. The results were most striking the sooner the infiltration following the injection subsided. There was only one failure. Schnaudigel considers arsenobenzol as a remedy of enduring value for ophthalmology.

Flemming reports his observations in 180 cases of syphilis treated with salvarsan. The greatest part of the cases came from the dermatological clinic of the Charité, some from the internal and neurological clinics. Most of the syphilitic eye-diseases, seventy-two in number, were observed and controlled for a longer time at the eye clinic. The Wassermann reaction was applied in each case, and salvarsan was injected subcutaneously from 0.3 to 0.7 grm. per kilogram body-weight of adults, and 0.008 grm. per kilogram in children. Flemming considers this method as the most expedient. In none of the cases did it produce lasting disturbances. In almost all cases the action of arsenic was shown by increase of weight and of vision, *e. g.*, from $\frac{5}{5}$ before the injection to $\frac{5}{4}$ after it. With very few exceptions, there was not a much more rapid improvement than with other antisyphilitic remedies. Frequently, intense subjective disturbances, as headache in papillitis, irritation in interstitial keratitis, or lancinating pain in tabes, promptly disappeared after injection; but the anatomical pictures of keratitis, iritis, papillitis, or the pupillary alterations in tabes did not change faster than after mercury and the iodides.

The clinical reaction gave the impression of a specific and elective effect, but it does not suffice for a cure. A "therapia sterilisans magna" for man does not exist.

In some cases of specific keratitis in children, a decided influence was apparent in the rapid decrease of irritation, but in others no influence was apparent; while in some it was only noticeable in connection with mercury and the iodide. More was accomplished in recent and old cases of iritis. In specific opacities of the vitreous, the action was very prompt, *e. g.*, in one case V. rose within two days from 5/1 and 5/25 to 5/10 and 5/7.

Not the slightest result was obtained in sympathetic ophthalmia, and enucleation had to be performed. In a case of choked disc almost complete recovery followed after two weeks; in others and in syphilitic endarteritis of the eye, in concordance with Oppenheim, not the least effect was seen. Complete ocular palsies, atrophy of the optic nerve and papillary disturbances in metasyphilitic diseases were not influenced.

In 10 cases, pupillary differences in otherwise healthy eyes were observed before and after injection; in 3 cases before, in 7 after injection. All were in the secondary stage, *i. e.*, from a few months to two years after infection. So far pupillary differences were described only in metasyphilitic forms. Probably these pupillary disturbances in relatively recent lues were not observed before, because patients with secondary symptoms without iritis rarely consult an oculist or neurologist, and other specialists pay less attention to measurements of the pupils. Flemming considers the occurrence of paresis of the facial and ocular nerves, and optic neuritis observed by some authors and attributed to the action of arsenic, as syphilitic manifestations, because they were unilateral, whereas such affections from intoxication by atoxyl, etc., were without exception bilateral. Relapses occurred in eight out of the 180 cases. Whether they are more frequent after salvarsan or mercury cannot yet be decided. Flemming says as far as we can judge, since the short time that salvarsan has been in use, it must be welcomed as an effectual specific remedy in syphilis of the eye, which seems especially indicated in cases in which, after failure of mercury and the iodide, speedy aid is urgent. It has not proved the panacea for ocular syphilis, that can entirely supplant our usual specific preparations. On the other hand, deleterious effects of arsenobenzol on the eye have not been observed. These must be considered as symptoms of lues which existed without injection, but gained greater importance by the injection in the sense of Herxheimer's reaction. Seventeen cases, illustrating maximal and minimal values of reaction, are tabulated.

In a former communication on 14 cases (*Ophthalmology*, April, 1911), von Grosz stated that simple atrophy of the optic nerve, which occurs mostly as a consequence of tabes, is a contraindication to "606." Now he waives this contraindication, if the remedy is otherwise indicated. In some of the 60 cases of syphilitic eye affections, he observed, as accessory symptoms, slight necroses of the skin, and in three cases small corneal infiltrations, which healed eventually. Three cases required a second injection; and cases of iritis, optic neuritis, and ocular palsies, which developed after a relapse of lues, were cured in a similar manner. This proved that these affections were simply relapses and could not be ascribed to arsenobenzol.

Von Grosz concludes: Arsenobenzol is uninjurious for the optic nerve. Aggravation of an existing eye-disease through the remedy is not to be feared. Improvement of simple optic atrophy is not to be expected, but

this is not a contraindication to its application. A favorable result is most likely in luetic iritis, chorioretinitis, direct luetic ocular palsies, and finally in suitable cases of parenchymatous keratitis. Nothing can be said as to lasting cures, as this requires much time.

The experience gained from the use of atoxyl led Ehrlich especially to caution against the use of "606" without a previous careful examination of the eyes. Over 100 cases of blindness have been reported following the use of atoxyl. Schanz had opportunity to examine a considerable number of patients treated with "606," and in no case was there any eye-lesion attributable to its use. In the literature on salvarsan there is as yet no case known where blindness has followed as was the case after using atoxyl.

The question whether "606" is to be used in atrophic conditions of the optic nerve is an important one. Where the cause is possibly specific there is a possibility of arresting the condition. Is it justifiable to use a preparation somewhat allied to atoxyl when the latter produces optic nerve atrophy? The characteristics of atoxyl atrophy are well known and have been anatomically studied. Schanz advises the use of "606" even in the optic atrophy of tabes. The after-effects, as reported now from a number of reliable sources, do not warrant a fear of its working harmfully, and there is, moreover, the possibility of arresting the atrophic process.

Siegrist emphasizes that the morbid agent of sympathetic ophthalmia undoubtedly resembles the agent of syphilis. In sympathetic ophthalmia, as in syphilis, it may remain latent for months and years, and then suddenly become active. Relapses are frequent in both diseases, and since there is a great similarity between sympathetic ophthalmia and syphilis, salvarsan is used by ophthalmologists in incipient and fully-developed sympathetic ophthalmia. Siegrist therefore injected 0.3 gm. of "606" into a patient, aged sixty, with sympathetic ophthalmia. V. which was 15/100 immediately before injection, rose on the third day to 9/10, with almost complete disappearance of the opacities of the vitreous.

Schanz reports 2 cases of syphilitic optic neuritis following treatment by injection with salvarsan. In both cases the condition of the nerve was cured by repetition of the injection of salvarsan. The optic neuritis could not have been caused by the first injection. In both cases the eyes were examined before the first injection and very slight change in the disc noted. The changes, though noted on the histories at the time, were not considered significant. Some months later the optic neuritis had seriously interfered with vision. That an inflammatory condition had remained latent for some months appears improbable. It was certainly a recurrence of the syphilis due to lack of complete cure after the first injection of the salvarsan.

A number of cases of recurrence of syphilis, as shown in the eye, have been reported. Axenfeld and Cohen saw recurrence in the form of specific iritis. Fisher, Fehr, Hesse, Tolnai, have all seen luetic recurrences in the eye after salvarsan treatment.

Jansen states, that several days after an intravenous injection of 0.4 gm. of salvarsan, the patient happened casually to mention that, commencing four hours after the injection, everything seemed to waver before his eyes for three hours. Jansen believes that if this occurrence were closely studied, irritation of the optic nerve (*heftiges Flimmern*) might be found frequent after injection of this drug.

Gerber states that salvarsan, if correctly used, is an effective and

absolutely safe therapeutic measure for oto-laryngological affections. He attributes the absence of much clinical data by specialists in this field to the fact that the specialists did not obtain it until it was put on the market. He has tested its effect in 12 cases of lues, one of scleroma, two of angina, and one of scurvy. He used both the intramuscular and intravenous methods, but prefers the latter, since he found that though in it the immediate after-effects are more unpleasant, the course of treatment is much smoother. However, by neither method did he encounter any permanent ill effects, though he did not restrict the size of the doses. In one instance, he administered to a delicate woman a second intravenous injection (0.6 gm.) a few weeks after an intramuscular injection of 0.3 gm. In instances where the lumen of the vein was missed, slight infiltrations arose at the brachialis anticus, but caused no serious inconvenience to the patient. All the luetic cases reported by Gerber had been previously treated without effect. Under salvarsan therapy the secondary cases were relieved in four to nine days, and all but one of the tertiary cases were relieved in four to fourteen days. This one case—necrosis of the nasal maxilla, a condition which is always relieved with difficulty—healed after six weeks. One was a case of stenosis of the larynx, on whom every possible procedure had been ineffectively attempted, and which had necessitated repeated tracheotomies. Four days after the injection, the dyspnea and the laryngeal stenosis disappeared. In almost all the cases, the Wassermann reaction became negative. Equally good results were obtained in treating Vincent's angina and scurvy. The results in the latter instance open up the possibility of effecting a cure by this therapy in cases where an ulcerous non-specific process exists. In the one case of scleroma reported, a negative result was obtained, but the author feels that this was merely due to an insufficient dose.

Rost reports his experiences with salvarsan in the treatment of the tropical diseases—framboesia, lepra, and granuloma tropicum. He used only the intramuscular method and had no unpleasant results, even though some of his patients were as young as three years, and some were cases in which the disease had been developing for several years. Caucasians, negroes and Indians reacted alike to the injections. In all, 300 cases of framboesia were treated and showed satisfactory results. About twenty-four hours after the administration of the drug—in 3 cases as early as sixteen hours after the injection—a fine white peripheral ring formed around the swelling; they lost their turgor and began to dry up. After five or six days only crusts were left which could be taken off easily with the finger nail, and disclosed a tender smooth layer. The swellings in the lymph-glands also disappeared rapidly. Nasal conditions alone did not respond favorably; in 2 cases the whole body healed but the nose remained uninfluenced. Alston, who experimented upon some of Rost's cases by injecting the serum of patients treated with salvarsan, obtained good results. Nine case of lepra were treated, the ages of the patients ranging from fifteen to forty years. A dose of 0.5—0.6 gm. of salvarsan was given, but no definite change was observed. The same unsatisfactory report is made of this method of therapy for granuloma tropicum.

Alston has found salvarsan to be the most effective drug for use in framboesia. Of the 21 cases injected, thirteen were entirely cured, three on the road to recovery and five stationary. The serum of cases recovering under salvarsan when injected into cases of framboesia has a curative effect apparent as early as the fourth or fifth day. Alston also injected a goat with "606" and fed the milk to two children. Improvement was noted on the third day with complete recovery in fourteen days.

Following the method of Bokay, Mayerhofer used salvarsan in the treatment of a stubborn case of chronic recurrent post-rheumatic chorea minor and obtained excellent results. The patient was a girl, aged seven years, in whom the condition had been existing for three years. Mayerhofer effected a cure after two injections (one of 0.25 gm. and the other of 0.5 gm.) in the course of two months. After-effects, such as fever, pain, loss of weight and even cutaneous necrosis, he regards of little significance as compared with the cure. He enthusiastically recommends this therapy.

Montesanto states that arsenobenzol in subcutaneous injection or given intravenously in small doses is without action on Hansen's bacillus. Average doses given intravenously have certainly an effect which is seen in the Herxheimer reaction on the surface of the leprous lesions. Large doses of salvarsan possess destructive qualities in regard to Hansen's bacillus, though not destructive enough to prevent the invasion of the organism. Salvarsan brings about cicatrization of the leprous ulcerations, but it is ineffective in lepromas and ulcers. Montesanto gives two indications for treatment of leprosy by "606": (1) In the beginning of the disease when one may suppose that the number of active bacilli is still small; and (2) where there is a loss of substance on the surface of the integument.

Czerny and Caan have studied the effect of salvarsan injections in a number of cases of malignant tumors. In all these cases they had recourse to intramuscular injections. They are of the opinion that in all cases of inoperable malignant tumors, where there is a positive Wassermann reaction, treatment by salvarsan should be essayed. In a number of epitheliomas the result was at least an amelioration of the pains. This was also observed in many cases of sarcoma in which a softening of the neoplasm after the injection was noted. In a case of sarcoma of the parotid, in which there were two relapses after extirpation, the injection of salvarsan into the tumor itself combined with gluteal injection of the medicine resulted in the elimination of the tumor by necrosis of the mass; and a complete cure took place which has now lasted for many months. In regard to this tumor, it should be stated that the histological examination left some doubt as to its real sarcomatous nature.

A case of lymphosarcoma after an injection of salvarsan showed a slight amelioration in a passing diminution in the ganglionic masses, but this was only temporary, for shortly afterwards the issue was fatal. Two other cases of lymphosarcoma were not at all influenced.

The authors think that even when tumors are operable, it is necessary, provided there is a positive Wassermann reaction, to inject salvarsan before recourse is had to operation. It should be stated here that this treatment should not be followed in cachetic and feeble persons.

PNEUMONIA: IMMUNITY AND TREATMENT.

A REVIEW OF RECENT LITERATURE.

By S. STROUSE, M. D., of the Editorial Staff.

1. Rosenow: Anaphylaxis and the Toxic Substance from Virulent Pneumococci. (*Journ. Amer. Med. Assoc.*, LVII., p. 285, 1911.)
2. Strouse and Clough: Blood-Cultures in Pneumonia. (*Bull. Johns Hopkins Hosp.*, XXI., p. 247, 1910.)
3. Neufeld and Haendel: On the Production and Testing of Anti-pneumococcus Serum, and on the Outlook for a Specific Treatment of Pneumonia. (*Zeitschr. fuer Immunitaetsforsch.*, III., p. 159, 1909.)
4. Neufeld and Haendel: On the Origin of the Crisis in Pneumonia, and on the Action of Pneumococcus Immune Serum. (*Arbeit a. d. Koenig. Gesundheitsamte*, XXXIV., p. 166, 1910.)
5. Neufeld and Haendel: The Significance of Atypical Varieties of the Pneumococcus. (*Arbeit a. d. Koenig. Gesundheitsamte*, XXIV., p. 293, 1910.)
6. Seligman and Klopstock: Experiments to Explain the Pneumonic Crisis. (*Zeitschr. fuer Immunitaetsforsch.*, IV., p. 103, 1909.)
7. Boettcher: Studies on Bacteriotropins of the Blood-Serum in Pneumococcus Infections of Rabbit and Man. (*Deutsch. Archiv. fuer klin. Med.*, XCVIII., p. 93, 1910.)
8. Strouse: Phagocytic Immunity in Pneumococcus Infections and in Pneumonia with Relation to the Crisis. (*Journ. Exper. Med.*, XIV., p. 109, 1911.)
9. Rosenow: A Bacteriological and Cellular Study of the Lung Exudate During Life in Lobar Pneumonia. (*Journ. Infect. Dis.*, VIII., p. 500, 1911.)
10. Strouse: Experimental Studies on Pneumococcus Infections. (*Journ. Exper. Med.*, XI., p. 743, 1909.)
11. Dold: The Bactericidal Action of the Blood-Plasma and Serum on the Pneumococcus, and Its Relation to Immunity. (*Arbeit a. d. Koenig. Gesundheitsamte*, XXXVI., p. 419, 1911.)
12. Schneider: On the Mode of Action of Pneumococcus Immune Serum. (*Centralbl. fuer Bakteriolog.*, 1st Abteil., Ref., XLVIII., p. 271, 1910.)
13. Lamar: Chemo-Immunological Studies on Localized Infections. (*Journ. Exper. Med.*, XIII., p. 1, 1911.)
14. Bruning: Pneumonia in Children, and Pneumococcus Serum. (*Deutsch. med. Wochenschr.*, XXXV., p. 1828, 1909.)
15. May: Action of Roemer's Antipneumococcus Serum in Croupous Pneumonia, with Especial Regard to the White Blood-Corpuscles. (*Muench. med. Wochenschr.*, October 13th, 1908.)

16. Krische: Serum Therapy of Croupous Pneumonia. (*Med. Klinik.*, XLIV., p. 1681, 1908.)
17. Monti: The Treatment of Genuine Pneumonia with Roemer's Serum. (*Arch. fuer Kinderheilk.*, XL., Heft. 1 and 2, p. 45, 1908.)
18. Stoner: A Résumé of Vaccine Therapy. (*Amer. Journ. Med. Sciences*, CXXI., p. 186, 1911.)
19. Rosenow: The Autolysis of Pneumococci and the Effect of the Injection of Autolyzed Pneumococci. (*Journ. Amer. Med. Assoc.*, LIV., p. 1843, 1910.)
20. Mitchell: The Limelight on Pneumonia. (*Medical Record*, LXXX., p. 264, 1911.)

Students of pneumonia have been compelled to pursue a slow, steady course in their attempts to unravel the mystery of the disease and to effect a rational cure. Pneumonia offers a peculiarly fascinating and baffling problem to the student, standing as it does almost alone in any classification of infectious diseases. Acutely violent in its onset, course and termination, and associated with a most remarkable bedside phenomenon—the crisis, attempts to know the disease have necessarily centered around attempted explanations of the onset, around studies of the changes in the body during the short period of infection, or around the crisis. As for its onset, earlier work has shown definitely that all people may harbor the pneumococcus at some time and that some people harbor it all the time, but what the exact nature of the change in the host or in the infective agent may be, which determines the onset, is no more understood to-day than it was when the term “lowered resistance” was first used. And to-day when the terms of immunity reactions are being translated into accurate chemical formulæ, “lowered resistance” must be considered merely words to hide our ignorance. The possibility, that some phase of the phenomenon of anaphylaxis may account for many of the symptoms of pneumonia, has been suggested by recent work of Rosenow. The similarity in the explosive suddenness of the onset to the instantaneous anaphylactic reaction is too striking to pass unnoticed; but as yet the two phenomena have not been correlated, and the sum of our knowledge of the onset of pneumonia must be embraced in the hypothesis that either the pneumococcus becomes more virulent or that something happens to the host to permit the entry of the coccus into the body.

As to the nature of the disease, opinion has veered to the conception of it as a general bacteremia and toxemia associated with inflammation of the lung. Just as in typhoid fever blood-cultures revealed the fact that typhoid was not a mere inflammation of the bowel, so in pneumonia the same means of study demonstrated the presence in a large proportion of cases of the pneumococcus in the circulating blood. Formerly the opinion was held that only in severe cases could the pneumococcus be isolated from the blood, and its presence was considered of grave prognostic value; but the work of Prochaska in Zurich, of Rosenow in Chicago, and of Strouse and Clough in Baltimore proved that in certain epidemics, at least, pneumococcemia was a common occurrence and had no prognostic significance. Whether the organisms entered the blood before or after invasion of the lung has never been settled; and it is doubtful if this question has more than a theoretical interest, for surely the source of the “toxines” that produce the symptoms must be the local disturbance in the lung.

Undoubtedly the study which offers most promise deals with the means

whereby the human body defends itself against invasion, for only with clear ideas of this mechanism can prospects of a specific cure be entertained. Up to quite recently certain facts in relation to the resistance of lower animals to pneumococcus infections gave a powerful stimulus to work along the lines of phagocytosis. The other known antibodies had been found wanting, and the early work of Mennès showed the presence of a substance in the serum of immunized animals, which increased the phagocytosis of pneumococci. Then the refractoriness of most lower animals to pneumococcus infection bore a distinct relationship to their ability to produce phagocytosis. The remarkably encouraging work of Wright and of Neufeld added extra stimulus to the study of opsonins in pneumonia and in other pneumococcus infections; and it was not a broad jump to conclude from the presence of leukocytosis and of phagocytosis in pneumonia that the immunity of the crisis was a phagocytic immunity. The culmination of these studies arrived with the demonstration of opsonins in the circulating blood of pneumonia patients, and here the studies of Neufeld and his associates in Berlin stand prominent. The facts as they stand to-day are that opsonic immunity does occur in pneumonia, and that it may be increased after crisis.

But there is a gradually increasing dissenting view to the effect that the crisis may after all not be due to phagocytosis of the pneumococci. In the first place, were such a simple phenomenon the sole cause of the change, better practical results should have been obtained in treatment with opsonic serum. Then the inability of other authors to substantiate the claims regarding the presence of opsonins (Seligman, Boettcher, and Strouse); the recent work of Rosenow showing that the destruction of pneumococci in the lungs of pneumonia patients is as great in the patient that dies as in one that recovers; and finally the proof that other factors may play an important rôle in protection against the pneumococcus, all pointed toward the supposition that in the discovery of one detail other more important ones had been overlooked. For instance, it was found that the rule of resistance of animals by increased phagocytosis was not upheld by the one species which is totally resistant. The pigeon cannot be infected with pneumococcus, and yet neither its serum nor its leukocytes possess any increased phagocytic properties for the pneumococcus, and it is believed that the immunity in this case is due to the normal high temperature (Strouse). Then Dold claims to have found a "pneumobactericidal" substance in the blood and plasma of normal human beings, which plays an important rôle in the resistance during pneumonia; and Schneider finds similar bodies arising from the leukocytes. Furthermore, the complete studies on the many other properties possessed by leukocytes—both so-called immune bodies and ferments, and the likely supposition that they possess many other properties still unknown, renders unjustifiable any reasoning making leukocytosis and phagocytosis equivalents. The chemical side of the immunity in pneumonia is now being studied, and already Lamar has obtained most interesting results showing that such a simple soap as sodium oleate profoundly alters the structure and properties of the pneumococcus, and renders it easily acted upon by an immune serum. If it is remembered that soaps are present in exudates, the importance of Lamar's work is great. The newest thought in the chemistry of pneumonia is that offered by Mitchell to the effect that the symptoms of pneumonia are due entirely to calcium starvation. Hidden in a haystack of dogma, and theoretical as is his contention, it is nevertheless based on some fundamental facts. The theory of calcium

starvation is one so easily proved or disproved by experimental methods, which Mitchell did not use, that it is necessary to withhold an opinion of the value of his theory until experimental data are forthcoming.

Unsatisfactory as is the state of knowledge regarding immunity in pneumonia, specific treatment is even less satisfactory. The immune serum of Roemer has been extensively used, and the reputed results vary greatly. That such variation is due at least in part to biased judgment or incomplete observation seems natural. Bruning treated 6 cases in children without good results; May saw practically no differences in the cases treated with or without serum; Krische reports favorable results, as does Monti. Vaccine therapy has also been employed, but as yet vaccine therapy cannot be considered very successful in acute febrile conditions, and the results in pneumonia must remain doubtful. Anyone, who has had experience in the treatment of this baffling disease, must realize how fallacious are conclusions drawn from any line of treatment except in a very large series of cases. The death-rate varies in different epidemics and different localities, and in any single season the first twenty-five cases may get well under the same treatment as permits the next twenty-five to succumb. Hence the statistics collected by Stoner, showing 135 recoveries in 155 cases treated with vaccines, must be accepted with caution.

Something different from the usual vaccine treatment was Rosenow's discovery of the effect of washed, autolyzed pneumococci on an infection. He had previously shown that suspension of virulent pneumococci in salt solution had a marked effect on the bacteria, rendering virulent organisms avirulent; and he subsequently found that the bodies of the bacteria so treated used as a vaccine had a decidedly beneficial effect. As yet he has not published clinical observations, but the subject offers much promise.

DISTURBANCES IN THE RIGHT ILIAC FOSSA.

A REVIEW OF RECENT LITERATURE.

By JESSE S. MYER, M. D., of the Editorial Staff.

1. Martin: The Significance of the Lane Kink of the Ileum. (*Surgery, Gynecology and Obstetrics*, January, 1911.)
2. Mayo, C. H.: Intestinal Obstruction Due to Kinks and Adhesions of the Terminal Ileum. (*Surgery, Gynecology and Obstetrics*, March, 1911.)
3. Wilms: The Movable Cecum as the Cause of Many Cases of So-Called Chronic Appendicitis. (*Deutsch. Med. Wochenschr.*, October 8th, 1908.)
4. Wilms: Chronic Appendicitis and Cecum Mobile. (*Arch. Klin. Chir.*, July, 1911.)
5. Klose: Habitual Torsion of the Movable Cecum. (*Muench. Med. Wochenschr.*, No. 7, 1910.)
6. McWilliams: Carcinoma of the Vermiform Appendix. (*Am. Journ. Med. Sciences*, CXXXV., 1908.)
7. Harte: Primary Carcinoma and Sarcoma of the Appendix Vermiformis. (*Annals of Surgery*, June, 1908.)
8. Horsley: Carcinoma of the Bowel and of the Appendix in the Young. (*Journ. Amer. Med. Assoc.*, May 8th, 1909.)
9. Editorial: Cancer of the Appendix. (*Journ. Amer. Med. Assoc.*, January 14th, 1911, p. 122.)
10. Leconte: Carcinoma of the Appendix with Metastases to the Ileocolic Glands. (*Annals of Surgery*, June, 1908.)
11. Brunton and Glover: A Case of Malignant Disease of the Vermiform Appendix. (*Lancet*, February 12th, 1910.)

Despite the fact that our attention has been rather prominently directed to the right iliac fossa for some years, it has remained for the past year or two to bring to our notice several conditions of decided importance, from a standpoint of diagnosis and treatment. Mr. Lane some months ago called attention to the rather frequent existence of kinks or bends in the terminal four inches of the ileum, and since that time a number of surgeons have corroborated his observations. As to the exact cause of this condition, there seems to be some variety of opinion. In fact, there seem to be several factors which, working alone or together, may give rise to such a condition; thus where the large bowel is unduly movable, or where there is a general ptosis of the abdominal viscera, usually in such cases following extreme loss of fat, and in the condition known as enteroptotic habitus. Again, the condition seems to be associated with inflammatory processes, and Mayo has found the condition most frequently in association with chronic inflammation of the appendix. On the other hand, it occasionally appears to be congenital. From what-

ever cause they may arise, the peritoneal bands are often quite thick, passing from the terminal portion of the ileum to the parietal peritoneum, and sometimes to the cecum, causing the kink. As to the symptomatology, since this condition and appendicitis are so often associated, it is not always possible to differentiate the two. Like pathological conditions in the appendix, symptoms arising from the Lane kink are usually referred to the stomach, and the patient complains of various "dyspeptic" symptoms. The region of the kink is usually tender, extending from the umbilicus downward to the right, while localized pain may also be obtained. The pain is increased by peristaltic activity, especially when this is caused by the activity of the individual. The intestinal and gastric symptoms are often more marked at fairly regular periods after eating, and frequently there is a distension of the small intestine in evidence when the individual is fatigued. In some cases there is constipation, but this is by no means a constant symptom. The relief from the condition by operative means consists in severing the restraining bands and preventing new adhesions.

One condition, which it seems bears some relation to the foregoing, was brought to our attention by Wilms a few years ago. It is not unusual in operations for chronic appendicitis, to find very little disease of the appendix, and in a certain number of such cases to find the patient little relieved after the operation. In fact, if surgeons were more particular to observe the end-results of their cases, this coincidence, in Wilm's opinion, would be much more striking. He has found in many cases, diagnosed as chronic appendicitis, a long and unduly movable cecum, and in certain cases in which appendectomy failed to remove the symptoms, and a second operation, aimed at correcting the undue mobility of the cecum, cured the patient. In 5 cases in which he noted at operation a distinctly movable cecum, but in which only a simple appendectomy was performed, there was no relief following the operation. The condition is most often associated with the enteroptotic habitus, and is variously estimated that from 10 to 23 per cent. of individuals have a mesocecum, that is an unusually movable cecum. In not all of these cases does the condition give rise to symptoms. Just what causes the pain in these cases is still a matter of dispute. The fact that relief is often obtained after appendectomy suggests that the pull of a distended cecum on a short mesenteriolum may be one cause of the symptom. Klose, on the other hand, believes that only a torsion of the cecum at its mesentery gives rise to complaint. If the abdominal press is sufficient, the fact that the cecum has a mesentery and may move is of no importance. Only after this abdominal counter-pressure is impaired by pregnancy or rapid loss of weight, does torsion with consequent symptoms occur. Colics, which are relieved by reclining posture, are especially characteristic of the condition. There is often constipation, followed by diarrhea and meteorism. The fact that the colics are fever free is especially significant. On palpation gurgling sounds can be elicited over the cecum, and there is often a distinct tumor. The x-ray will show bismuth in the cecum thirty-six hours or more after ingestion, while in the normal individual it should be beyond this point considerably before this.

So much thought has been given to the appendix itself, that it is with little surprise, we note, that it is only in quite recent times that particular attention has been paid to such an important condition as carcinoma of the appendix. Especially is this so since it seems that this condition exists in about $\frac{1}{2}$ per cent. of all appendices. That it has not been recog-

nized before is due, it seems, to the peculiar nature of the appendix carcinoma. These growths do not partake of the general characteristics of carcinoma, are quite benign, of very slow growth apparently, and occur in early life, 72 of 92 cases collected by Harte being in individuals under forty years of age. For these reasons, and on account of certain histological characteristics, some pathologists have classed these tumors as endotheliomata. In a material of 5,000 appendices, examined by MacCarty and McGrath, carcinoma was found 22 times. In the majority of these cases, the growth was not large enough to be seen on the serosa, and the diagnosis was, therefore, impossible for the surgeon. None of the growths had produced metastases, and age seemed to have no influence upon their occurrence. Ninety per cent. of the tumors occurred in the tip of the appendices, which had undergone a partial or complete obliteration. This location of the growth is borne out by all other observers, as likewise the fact that the tumors occur in appendices involved in a chronic inflammatory process. It is probable, therefore, that there is some causative relation between the changes incident upon appendicitis obliterans and appendix carcinoma. Carcinoma of the cecum seems to be a distinct condition and only in very rare cases arises from appendix carcinoma. The symptoms of the condition are those of chronic appendicitis, and the diagnosis is practically impossible before opening the abdomen. Even at operation, unless the growth has invaded the muscular and serous coats, which it shows little tendency to do, the diagnosis is not made. It remains as a rule for the pathologist to discover the presence of the tumor. Metastases are a decided exception, and, as mentioned above, the tumors are essentially benign.

MEASLES.

A REVIEW OF RECENT LITERATURE.

By ALFRED FRIEDLANDER, M. D., of the Editorial Staff.

1. Sittler: A Hypothesis to Explain the Eruption of Measles. (*Muench. med. Wochenschr.*, No. 52, 1909.)
2. King: Measles and Mice. (*Washington Medical Annals*, March, 1910.)
3. Hamburger and Schrey: Diminution of the Susceptibility to Vaccine During Measles. (*Wiener klin. Wochenschr.*, No. 18, 1910.)
4. Karasawa and Schick: Antibodies in the Blood-Sera of Measles Cases against Diphtheria. (*Jahrbuch fuer Kinderheilkunde*, October, 1910.)
5. Sebilléau: Incubation Period of Measles. (*Gaz. Méd. de Nantes*, March 26th, 1910.)
6. Friedjung: Measles and Psoriasis. (*Deutsch. med. Wochenschr.*, p. 368, 1910.)
7. Rubens: Measles and Psoriasis. (*Deutsch. med. Wochenschr.*, p. 125, 1910.)
8. Schick: Measles and Tuberculin Reaction. (*Monatschr. fuer Kinderheilkunde*, Vol. IX., No. 3, 1910.)
9. Messa: Skin Tuberculides After Measles. (*Rev. di Clin. Ped.*, July, 1910.)
10. Brudzinski: Double Infections of Measles and Scarlet Fever. (*Arch. de Méd. des Enfants*, p. 1, 1910.)
11. Teilman: Measles Complicated with Emphysema. (*Hospitalstidende*, p. 225, 1910.)
12. Auerbach: Measles Epidemic. (*Arch. fuer Kinderheilkunde*, Vol. 55, p. 128.)
13. Lade: Diphtheria as a Complication of Measles. (*Archiv. fuer Kinderheilkunde*, Vol. 53, p. 128.)
14. Baldini: Hemorrhagic Measles. (*Arch. de Méd. des Enfants*, June, 1911.)
15. Siegert: Prophylaxis of Measles. (*Deutsch. med. Wochenschr.*, No. 31, 1910.)

Etiology.—Sittler has found a staphylococcus in the oral and nasal secretions of measles patients, which differed from *S. pyog. alb.* only through agglutination. The toxins of this germ pass into the circulation and the eruption of measles is thus to be considered as analogous to a serum exanthem. Definite proof of this theory is not offered, although King has reported several cases of measles in which infection seemed to be carried by straw containing excrement from mice. He assumes that in such cases there must be a dust inhalation, believing that the mice were

the germ-carriers. It is possible that this hypothesis affords an explanation of measles epidemics occurring in measles-free places, without the actual presence of measles patients.

Pathogenesis.—In the course of an investigation concerning the susceptibility of previously vaccinated children to vaccine lymph, Hamburger and Schrey found that during an attack of measles this susceptibility is much reduced. Whereas normal children previously vaccinated always showed a definite local reaction (Stichreaktion) on subcutaneous injection of diluted lymph, measles patients showed a marked reduction, probably to be explained on the basis of mutual effects of two infections on each other. The assumption that measles by virtue of its complicating catarrh of the upper respiratory tract, predisposes especially to diphtheria, has been studied carefully by Karasawa and Schick. They find, as the result of their studies on blood-serum of measles patients and normal patients, that measles as such produces *no* special predisposition to diphtheria; because during an attack of measles there is no diminution in the amount of antibody present in the blood-serum. It is not even settled, that the length of time of passive immunity is shortened by an attack of measles. As a result of clinical observation, Heubner had expressed the latter view.

Symptomatology.—Sebilleau has found certain symptoms regularly present during the incubation period of measles. Digestive disorders, with mild fevers, are common. The coryzal symptoms may be present, and disappear completely two or three days before the rash appears. A sudden and distinctly marked swelling of the cervical lymph-glands has also been noted. This glandular swelling disappears after the advent of the eruption.

Double Infections.—Friedjung reports a case of a girl of four, who for two years had had an unusually severe case of psoriasis. Ten days after admission to hospital she developed measles with pneumonia. During the attack the psoriasis scales fell off. During the next twelve years the girl had only a few mild attacks of psoriasis, which yielded readily to treatment. Friedjung suggests that repeated injections of serum in cases of psoriasis might cause a rash which would have a beneficial effect upon the psoriasis.

Rubens also records a case of severe psoriasis of fourteen years' duration in a man of twenty-eight, in which all the scales fell off on the third day of the eruption.

Schick reports the case of a child which had had repeated tuberculin injections on account of pleurisy. This child developed measles. With the advent of the eruption, the sites of the tuberculin injections became markedly reddened and showed distinct infiltration. The measles eruption became distinct at these areas long before it appeared elsewhere, showing the effect of the previous local irritation. Messa reports a case of a scrofulous child, in whom as the result of measles a necrotic tubercular dermatitis developed.

As a result of a study of 12 cases of double infection of measles and scarlet fever, Brudzinski comes to the following conclusions. The incidence of scarlet fever does not seem to predispose to measles. Recurrent measles was never observed as the result of scarlet fever. Furthermore, the incidence of measles did not seem to have a particularly bad effect upon the course of scarlet fever. The complications commonly seen in the two affections (otitis and bronchopneumonia) were common in cases of mixed infections. The character of the exanthem varied according to

whether the eruptions appeared simultaneously, or following each other. Desquamation was usually very marked in cases of mixed infection. Both types of desquamation were usually to be noted at the same time in these cases, so that the diagnosis of double infection could usually be made even at this period.

Teilman reports a case of measles in a girl of two and a half years complicated by capillary bronchitis. On the eighth day subcutaneous emphysema developed, appearing first in the cheeks and extending down to the pubes in front. Examination of the mouth showed a slight swelling of the mucous membrane in the region of Stensen's duct. The occurrence of the emphysema was attributed to forcible dilatation of Stensen's duct by the coughing. In this way the air was drawn into the subcutaneous tissue. The case ended in complete recovery.

Auerbach reports an epidemic of measles occurring in the infants' pavilion of a Hamburg orphan asylum. 66 cases were observed, 38 being under one year. There were eight infants under four months of age exposed, but none of them contracted the disease. 83 per cent. of the cases showed Koplik spots. Only three of thirty-eight children showed no complications. Twenty of the thirty-eight had pneumonia. The cases in the children under one year were much more severe than in the older children.

78 per cent. of all the cases had complicating otitis media. The total mortality was 37 per cent.; in children under one year, it was 50 per cent. In 14 of the cases there was a complicating diphtheria.

Lade, in a series of 112 cases of measles, had 13 showing a complicating diphtheria. He believes that the association of these two diseases is a very serious thing, and that the prognosis appears to depend inversely upon the difference in time between the measles eruption and the appearance of the membrane.

Baldini records several cases of measles of abnormal type. Among them was that of a child of twenty-five months. On the third day of the eruption a marked purpura occurred over the entire body. With this there was intense prostration. Temperature rose to 106° F. There was great disturbance in the gastro-intestinal tract. Blood present in the vomitus and in the stools. Death on the tenth day. According to the author these cases of hemorrhagic measles are excessively rare.

Prophylaxis.—Discussing the danger of contagion, Siegert says that it begins in the catarrhal stage, is at its highest in the transition period between the catarrhal and eruptive stages, and disappears only with the disappearance of the rash. Therefore any children not having had measles, who have been in contact with measles patients in the catarrhal stage, especially during the forty-eight hours preceding eruption, are to be regarded as infected. Inasmuch as the prognosis of measles in hospitals is very much worse than in homes with fair hygienic conditions, Siegert believes that special measures should be taken during measles epidemics in institutions. The practice of keeping acute and convalescent cases together, as well as simple with complicated cases, offers a good chance for the spread of the dreaded complications of diphtheria, scarlet fever, pneumonia and pertussis.

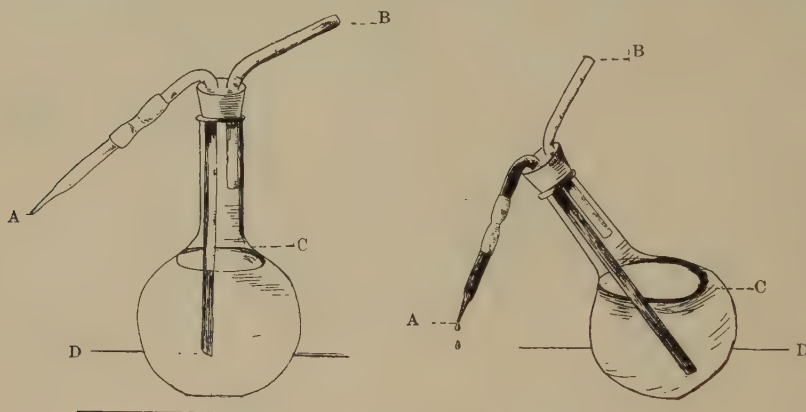
Therefore measles pavilions ought to be so arranged that they contain a large number of small isolation rooms, so that the cases may be kept separate as much as possible. Siegert even goes so far as to say, that uncomplicated cases of measles should not be admitted to hospitals.

PRACTICAL MEMORANDA.

HOW TO MAKE A WATER BOTTLE SERVE AS A DROPPER.

By S. STROUSE, M. D., of Chicago.

In every laboratory, no matter of what size, a water bottle is an essential; but often glass pipettes or eye-droppers are not found when needed. It is extremely simple to make an ordinary water bottle serve the purpose of a dropper in such a way as to regulate the number of



drops desired in a given time. This is done by converting the bottle into a siphon as illustrated by the sketches. With the bottle in the ordinary position, the exit tube A-D is filled with water by blowing on B; then the bottle is slanted so that the tip of the exit tube A is at or below the level of the water C in the bottle. A siphon is thereby formed, and the rapidity of the flow can be perfectly regulated by slight movements of the hand, raising or lowering the exit tip.

CONTROL OF PAIN FOLLOWING APPLICATION OF COPPER-SULPHATE CRAYON TO THE CONJUNCTIVA.

By JOHN GREEN, JR., M. D., of St. Louis.

None will deny the efficacy of copper-sulphate crayon for reducing or eradicating the granulations of trachoma. The ophthalmic world, with great unanimity, pins its faith to this method as proving, on the whole, the most successful non-surgical treatment. Unfortunately, the application has the disadvantage of causing much irritation and pain. The conjunctiva is intensely congested, the ciliary zone is reddened, and even the mucous membrane of the nose participates in the hyperemia. There are irritation with lachrymation and a deep-seated ache of the globe for several hours following the application. To lessen the pain various means have been proposed, the best being the local anesthetics—cocaine, holo-

caine, alypin, etc. But these fail to control to any extent the deeper ocular pain. Recently, Farnarier (*La Clinique Ophtalmol.*, April 10th, 1910) suggested that a 1 per cent. solution of acoin in oil be instilled immediately after the lids have been stroked with the copper crayon. He claimed that this method obviated not only the superficial irritation, but the deep pain as well. The writer has tried this method in 20 cases of trachoma, with the most gratifying results. The conjunctiva is first anesthetized with a weak cocaine solution (2 per cent.), the palpebral conjunctiva of the upper and lower lids is gently stroked with the crayon, and immediately a full-sized drop of acoin oil is instilled. The congestion and lacrymation following are very slight, and the deeper ocular pain is hardly noticeable. It is well to repeat the acoin oil drop in five or ten minutes.

"BANDAGES" FOR THE SURGEON'S FACE DURING OPERATIONS.

By FRANCIS REDER, M. D., of St. Louis.

The illustration gives a good idea of an efficient and a comfortable covering for the face during a hot-weather operation. The greatest concern for the surgeon during his hot-weather work is the care of the perspiration coming from his face. His greatest annoyance during his work is the careless and unsatisfactory mopping of his face by a nurse. Unless his face is properly cared for, frequent moppings have to be resorted to. This mopping is annoying, especially when the surgeon has to wear glasses, and, moreover, interferes with the work. Even when the mopping is well done, it is often unsatisfactory.



A piece of gauze thirty inches long, having a width of thirty-six inches, is folded so as to get eight layers, making the width of the "bandage" about four inches. Two of these "bandages" are necessary. One is placed about the forehead down to the eyebrows, and is secured behind with a safety pin. The other is placed so that it covers the sides of the face including the ears, the chin up to or including the mouth, and loosely resting against the throat. This bandage is secured on top of the head with a safety pin.

After operating, though the "bandages" be wet with perspiration upon removal, you can feel assured, nevertheless, that not a drop has escaped from the meshes, and that you have escaped the annoyance of mopping.

DIAGNOSTIC AND THERAPEUTIC NOTES.

PELVIC PERCUSSION.—Dionis and Sejour (*Gaz. des Hôp.*, 1911, No. 28). In connection with Ferrette the writers have discovered a method that promises to be valuable in diseases of the pelvic and lower abdominal viscera. If the anterior superior spines of the ilia are percussed, the note obtained on the two sides will differ in pitch and in resonance if there is a tumor or an exudate in or near either iliac fossa. This difference is most marked if the abdomen is distinctly tympanitic, a condition which would render the recognition of such lesions by the ordinary palpatory methods all the more difficult.

THE GERMAN METHOD OF TREATING MALARIA.—Werner (*Therap. Monatschr.*, 1911, No. 5). The Germans have studied the treatment of malaria with great care, both in Germany itself and in the German colonies in Africa, where the more severe forms are very prevalent. The general consensus of opinion favors Nocht's method. This consists in the administration of 0.2 grm. (3 grains) of quinine hydrochloride five times daily, making a daily dose of one gram or about 15 grains. This treatment is kept up for eight days. The after-treatment with smaller doses extends over two or three months. The results are said to be quite as good as with the more usual larger doses and the method has several advantages, such as the avoidance of cinchonism and of hematuria and the greater promptness with which the administration of quinine can be inaugurated.

Methylene-blue and arsenic have also an antimalarial action, but in this respect are not to be compared to quinine. The only other drug equal in efficiency to quinine is salvarsan in tertian malaria.

THE X-RAYS AND URINARY CONCREMENTS.—Telemann (*Deutsch. med. Wochenschr.*, 1911, No. 21). The writer points out that, whereas the statistics of Struëmpell, gathered in the pre-roentgenological period, indicate that a considerable percentage of all renal concretions are urate stones, the later statistics of Rumpel, based on *x*-ray investigations, seem to show that urate stones are rare, only one concretion in twenty-two being of this kind. To determine the cause of this discrepancy, Telemann studied the radiographic behavior of a great variety of renal calculi under various conditions. He found that when immersed in urine or imbedded in muscle-tissue, all stones were readily radiographed except pure xanthin stones and pure uric acid stones. The former are unimportant because of their rarity, the latter are not at all rare. When pure uric-acid stones are placed in surroundings resembling those in which they are found in the bladder or kidneys, and are then photographed by means of the *x*-rays,

they cannot be made out on the plate, since their opacity to x -rays differs but slightly from that of urine or muscle-tissue. Patients that clinically appear to have nephrolithiasis, but in which the radiographic examination is negative, may well be cases of pure uric acid calculus.

THE GASTRIC ORIGIN OF ANGINA PECTORIS.—Verdon (*Brit. Med. Journ.*, March 18th, 1911). In several cases of angina pectoris, the writer was able to abort the attack by introducing a stomach-tube into the stomach. A considerable amount of gas escaped through the tube, and the patient was almost immediately relieved of his pain. This observation is in harmony with the fact, generally known and noted in most text-books, that the anginal paroxysm often ends with the eructation of gas from the stomach. Verdon believes that in many, if not all, cases of angina pectoris, the attack is due to irritation of the vagus by the gastric meteorism. The proportion of cases due to coronary sclerosis, he believes, must be slight. Otherwise the percentage of deaths, due to angina pectoris, should increase with advancing age. The reverse is however true. In suitable cases, the stomach-tube treatment of this disease deserves a trial.

TESTING THE PUPILLARY REACTION.—Oppenheim (*Neurol. Zentralbl.*, 1911, No. 7). Oppenheim calls attention to a not infrequent source of error in testing the pupillary reflexes. It occasionally happens that, when electricity is used as a source of light, the pupils being tested by turning the light on and off, no reaction is obtained; whereas with the same patient, when daylight is used, the reflexes are seen to be normal. He believes that the sudden turning on of the electric light may cause an emotional shock that produces a pupillary dilatation sufficient to counterbalance the contraction due to the illumination. At all events, this is a possible source of error that should not be ignored.

THE SPINAL FLUID IN TUBERCULOUS MENINGITIS.—Hohn (*Berl. klin. Wochenschr.*, 1911, No. 18). If in a clear spinal fluid the amount of albumin is great, as compared with the bulk of the sediment, and if the latter consists, either solely or nearly so, of lymphocytes, and if the few polymorphonuclear cells present show evidence of degeneration, the meningitis is almost certainly tuberculous, even though the bacilli cannot be demonstrated.

A NEW TEST FOR BILE PIGMENT.—Guenther (*Med. Klin.*, 1911, No. 27). The following test for bile in the urine is said to be very delicate. To 5 c.c. glacial acetic acid add a trace (not more than 0.005 grm.) of magnesium-perhydrol, and boil. The urine is rendered strongly alkaline by means of a little sodium hydrate and is added to the above reagent. If the urine is dark and apparently icteric, only a few drops are used;

if pale, 5-10 c.c. are added to the reagent. If bilirubin is present, a brilliant green color results, either immediately or on boiling.

VINCENT'S ANGINA TREATED BY MEANS OF SALVARSAN.—Achard and Flandin (*Gaz. des Hôp.*, 1911, No. 50). The writers report a severe case of Vincent's angina with involvement of both tonsils and the soft palate. All treatment seemed of no avail. In view of the fact that one of the two etiological agents is a spirillum, local applications of salvarsan were inaugurated, first in solution, later as a powder. A surprisingly prompt cure resulted.

ANTIDIPHThERITIC SERUM FOR HEMORRHAGE IN TYPHOID FEVER.—Marotte and Oui (*Arch. de Méd. milit.*, 1911, No. 4). Weil first called attention to the value of serum injections in hemophilia. In several cases of obstinately recurring hemorrhage in typhoid fever, the writers have found the same procedure useful. Diphtheria antitoxin was used, it being the most readily obtainable form of sterile horse-serum. Large doses were necessary, the injection of less than 50 c.c. being ineffectual, but in this dosage a prompt cessation of the hemorrhage resulted.

BOOK REVIEWS.

A HANDBOOK OF PRACTICAL TREATMENT. By many writers. Edited by John H. Musser, M. D., LL. D., Professor of Clinical Medicine in the University of Pennsylvania, Philadelphia, and A. O. J. Kelly, A. M., M. D., Assistant Professor of Medicine in the University of Pennsylvania. Volume I. Philadelphia and London: W. B. Saunders Company. 1911. Price, \$6.00.

We confess to having entertained no small degree of expectancy in regard to the new work on therapeutics edited by Drs. Musser and Kelly. At the present day we hear so many rumors concerning therapeutic nihilism that a series of volumes written by so eminent a galaxy of contributors as those mentioned in the above, must inevitably prove a godsend. Limited space forbids a detailed review of all the chapters in the first volume. The introductory chapter on the "Fundamental Principles of Therapeutics" presents an accurate view of the correct methods to be followed in modern therapy. The chapter on dietetics is extremely practical. Dietetics in infancy is well presented, although more information on the home modification of milk would prove of the greatest interest to the majority of readers. In "General Principles of Drug Treatment" we find quality sacrificed to quantity. Many suggestions are extremely practical, but certain measures are incorporated that might better have been omitted. In many instances a whole array of medicaments is offered and the reader may use his discretion or good fortune in the selection of the best. There is nothing specific in the author's directions.

Thus, in uremia he advises the use of a wet-pack, omitting to state its caloric nature. The dosage of drugs is seldom suggested. "Serum Therapy" and "Organic Therapy" present the latest researches in those subjects. The "Rest Cure" and allied modes of treatment receive their proper consideration. Special methods are well illustrated. Hydrotherapy merits the appreciation that has long been withheld. The chapters on "Radio- and Electro-Therapy" will be welcomed by their special adherents. "Miscellaneous Measures" offers very practical information. The chapters on blood and the lymphatic system are concise, presenting the most approved methods of treatment.

THE EXPERIMENTAL CHEMOTHERAPY OF SPIRILLOSES. (Syphilis, Relapsing Fever, Spirillosis of Fowls, Frambœsia) by Paul Ehrlich and Hata. With contributions by H. J. Nichols, New York; J. Iversen, St. Petersburg; Bitter, Cairo; and Dreyer, Cairo. Translated by A. Newbold and Revised by Robert W. Felkin, M. D., F. R. S. E., etc., late Lecturer on Tropical Diseases, Edinburgh Medical School. With 34 tables in the text and 5 plates. New York: Rebman Company, 1123 Broadway. Price, \$4.00.

Any work to which Professor Paul Ehrlich gives his name must necessarily demand careful study, for he may be said to be the leader in experimental chemotherapy. It is, perhaps, to be regretted that these two volumes were not published before one or two incomplete publications saw the light, for it would seem to be necessary for the practitioner, who undertakes to treat cases with this new preparation, to understand thoroughly, not only the reasoning which has been employed in this production, but also to grasp the difficulties of the research, and appreciate fully the enormous amount of experimental work which was done before Professor Ehrlich and his colleagues were in a position to recommend the widespread introduction of this treatment to the medical profession throughout the world. No one can study these volumes without satisfying themselves that an enormous stride has been made in the treatment of relapsing fever, spirillosis of fowls, sleeping-sickness, and finally of syphilis. This English translation by A. Newbold is exceptionally good, and by comparison with the usual translation from the German, deserves commendation for accuracy and an intelligent interpretation of the spirit of the original work.

A MANUAL OF SURGERY. For Students and Physicians. By Francis T. Stewart, M. D., Professor of Clinical Surgery, Jefferson Medical College; Surgeon to the Germantown Hospital, Out-Patient Surgeon to the Pennsylvania Hospital. Second Edition. With 553 illustrations. Philadelphia: P. Blakiston's Son & Co. 1911. Price, \$4.00.

In its thoroughness and completeness this book is equal to many much more pretentious volumes, and it is valuable in that it brings its surgery right up to the latest phases as seen in practice. Originally intended only for undergraduates, as we learn from the preface to the first volume, the work has been prepared with the main idea of being both concise and complete; but there are few textbooks that can be so advantageously used in practice by physicians and surgeons. The descriptions of operative measures are models, though it seems rather unusual to find a surgeon naming medical remedies, particularly in tuberculosis. Nevertheless, it should be stated that tuberculosis and its administration are fully discussed. All mooted questions are fully discussed in the light of various opinions, thus resulting in the book's best asset for the practitioner—namely, a judicious manner of presentation of the most recent advances in medicine and surgery.

LEHRBUCH DER KRANKHEITEN DES HERZENS DER BLUTGEFÄSSE. By Dr. Ernest Romberg, O. Professor and Director of the Medical Clinic in Tuebingen. Second Edition, with 69 illustrations. Stuttgart: Ferdinand Enke. 1909.

This book of nearly 600 pages is an excellent treatise on the subject of heart and circulatory diseases. The first chapters are devoted to methods of examination and diagnosis. It is to be regretted that more space has not been given to this part of the book, for it is especially in this field that interest has centered in the past few years. The other chapters consider the organic heart diseases, diseases of the pericardium, organic diseases of the blood-vessels, heart and circulatory neuroses. Each part is followed by an extensive bibliography which makes the book especially valuable as a work of reference. A number of pages are devoted to the subject of arteriosclerosis. In the question of arteriosclerosis and nephritis the author takes the stand that the former process is not the direct cause of the pathological increase of connective-tissue in the kidney, but rather that the impaired circulation resulting from the arteriosclerosis makes the kidney more vulnerable and predisposes it to injuries resulting in nephritis.

The illustrations to the book are well chosen and a complete index is appended.

HAUTKRANKHEITEN SEXUELLEN URSPRUNGS BEI FRAUEN. Von Dr. Oskar Scheuer, Facharzt fuer Haut und Geschlechtskrankheiten in Wien. Berlin: Urban und Schwarzenberg. 1911. (Rebman Company, New York, Distributors for the United States.)

To every specialist, a careful study of the relation of his own specialty to other branches of medicine forms one of the most fascinating and fruitful features of his work. Familiarity with these borderlands is essential for the successful practice of any specialty, and the writer of this interesting monograph deserves credit for exploring thoroughly one of the less known borderlands. He discusses in a volume of 200 pages all skin manifestations of sexual origin observed in women. The material is well arranged in eleven chapters, thus enabling both the gynecologist and dermatologist to familiarize himself easily with the information at hand on any given question. How thoroughly the work has been done by the author may be deduced from the fact that the titles alone of the papers consulted and quoted in this volume fill 33 pages.

THE NON-SURGICAL TREATMENT OF DUODENAL ULCER. By George Herschell, M. D., Lond., Lately Senior Physician to the Kensington General Hospital and to the National Hospital for Diseases of the Heart, etc. London: Henry J. Glaiser. 1910.

This is a small volume of 40 pages, being a reprint from an article appearing in the *Clinical Journal*. The only unusual part of the author's method is the use of horse serum by mouth in the treatment of ulcer, on the theory that it contains bodies antagonistic to the destructive toxins causing the ulcer, and also stimulates tissue repair.